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Diseases *of the* Nervous System

A Practical Journal on Psychiatry and Neurology

(CONTENTS ON PAGE 64)

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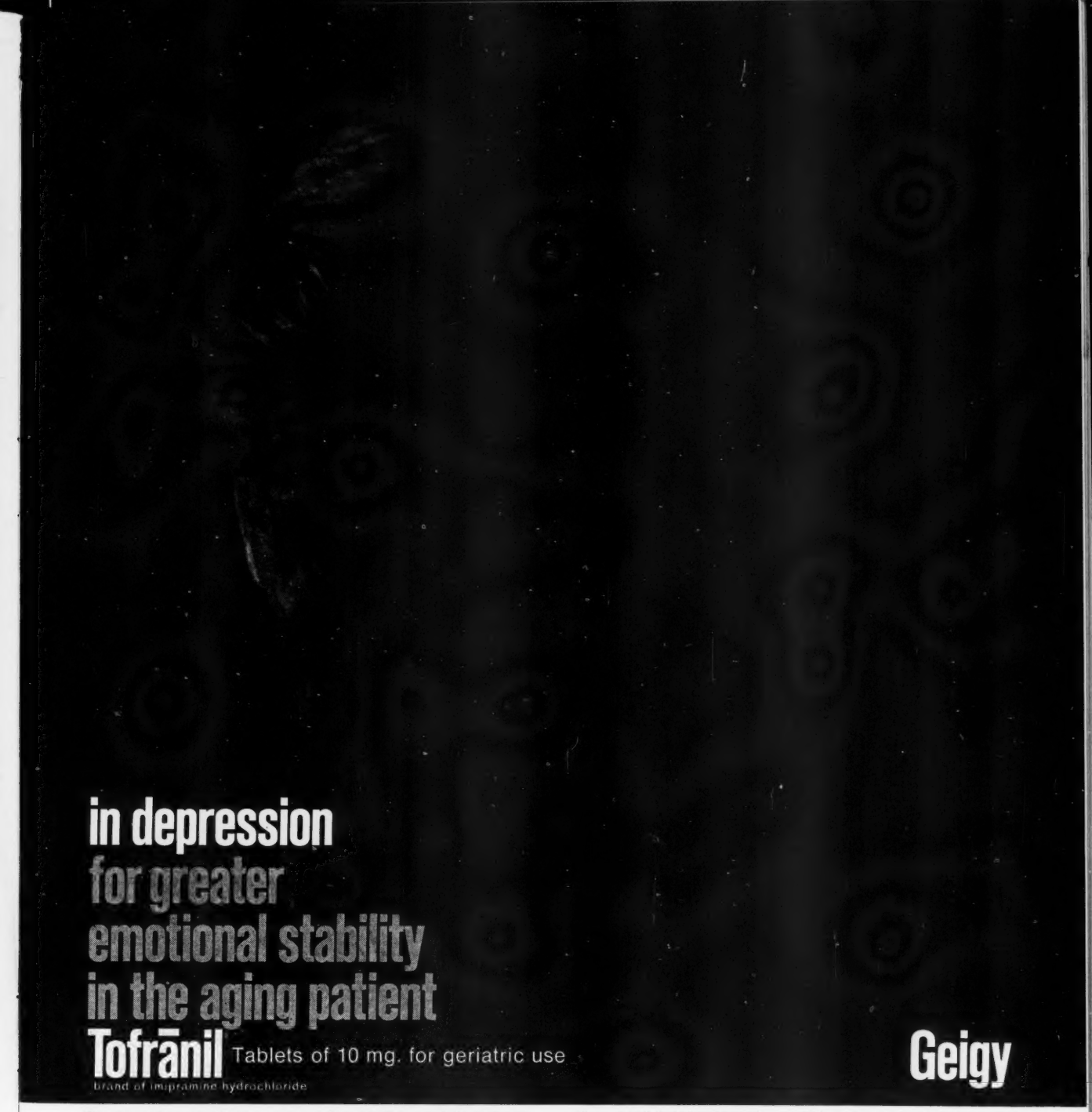

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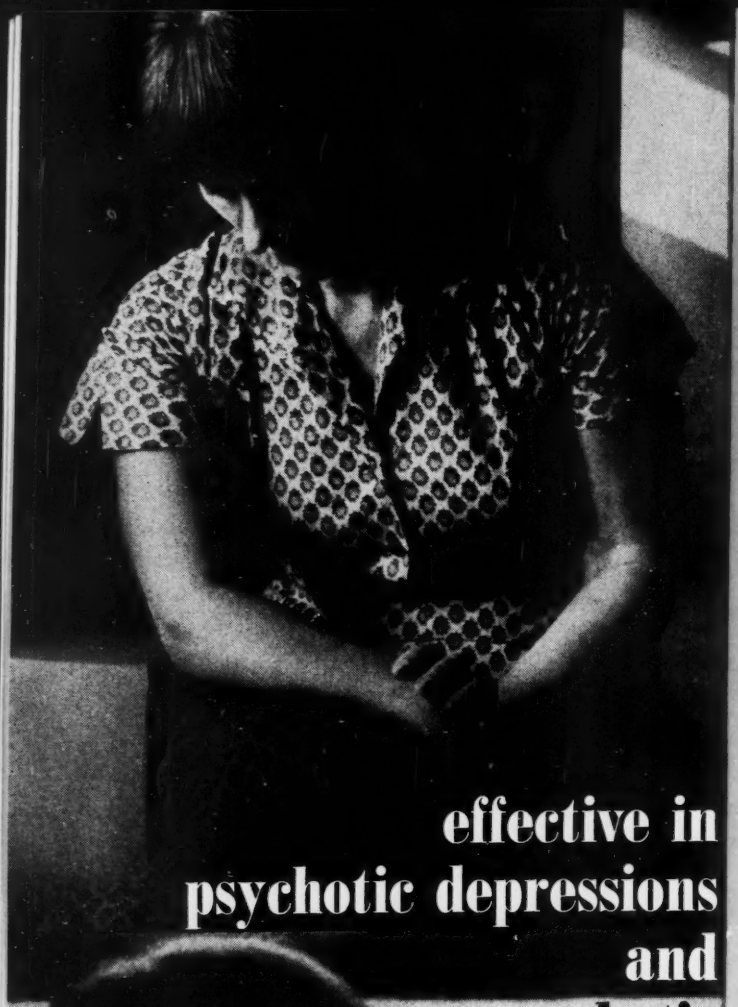

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DISEASES *of the* Nervous System

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

Duration of Impaired Consciousness as An Index of Severity in Closed Head Injuries: A Review

AARON SMITH, PH.D.

The immediate observable effects of nonpenetrating head injury range from a momentary daze followed by instant recovery, to prolonged coma ending in death. The spectra of later sequelae often include mental, emotional, sensory and motor dysfunctions in infinite varieties of combinations. In the absence of demonstrable anatomical changes in the brain, efforts to assess severity in terms of skull fracture, abnormal electroencephalographic records, air studies, cerebrospinal fluid, etc., have proven of limited value. Other indices such as simple concussion, cerebral edema, and cerebral contusion and laceration (Merritt[1]) or invisible contusion (Jefferson[2]) are primarily derived from hypothesized presence or absence of structural damage based on the duration of the interval of impaired consciousness.

Bay[3] has questioned the validity of differentiations between concussion and contusion because as yet no satisfactory morphological basis for concussion has been found. Although the boundary separating concussion and contusion is not absolute, concussion involving a loss or disturbance of consciousness from "only a few seconds or a minute or two at most" (Merritt[1]), "only a few minutes" (Symonds[4]), "less than 30 minutes" (Vorhis[5]) to a "variable period" (Echlin[6]), the essential difference is in the same dimension—the duration of disturbed consciousness. Thus, tacit in the differentiation between concussion and contusion or laceration is the assumption that the duration of impaired consciousness is an indication of severity of injury. The present paper is a preliminary review of several studies that provide data for determining the extent to which this assumption is actually supported. Although a discussion of the meanings of "consciousness" is outside the purview of this paper, under the generic term "impaired consciousness," I have included studies in which different durations of "coma," "unconsciousness," "disturbed consciousness" or "post-traumatic amnesia" (PTA) were reported. In an effort to develop measures of the degree of disturbance of consciousness, Cobb and Ruesch[7] proposed 18 graduated tests, the last of which was memory for recent events. As capacity to store current events was the criterion originally employed by Russell[8] (1932) for determining the end of the period of PTA, for convenience I have arbitrarily referred to the various scales of other investigators as PTA scales, although this should not be taken to mean that the same criterion was formally employed in these studies.

The observation that patients with coma following head injury were more critically ill than those without loss of consciousness was recorded over 2000 years ago (Mettler[9] 1945). Although Jackson[10] had taken account of when a patient with a head injury in 1865, reported "he recovered his senses," the first study in which the duration of impaired consciousness was systematically investigated as a possible index of severity was reported by Russell[8] (1932). In comparisons of 200 cases of head injury grouped according to duration of the loss of full conscious-

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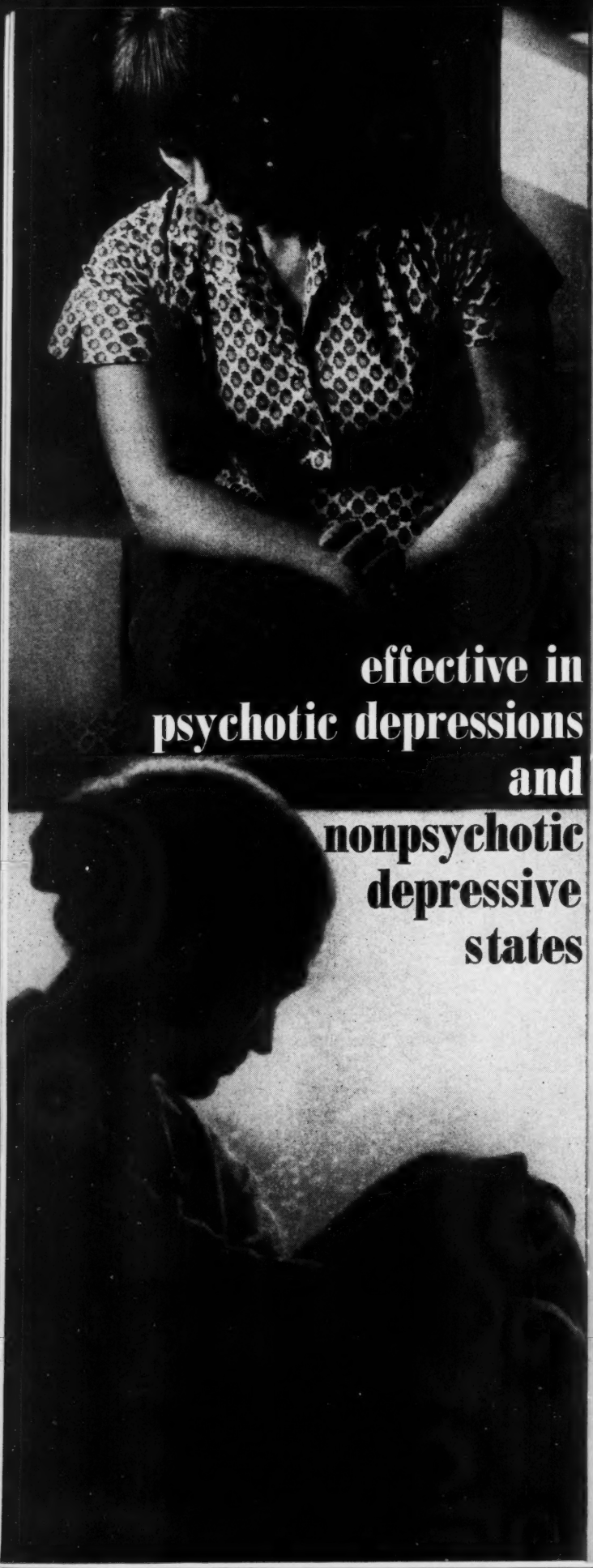

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ness (less than 1 hour, 1 to 24 hours, more than 24 hours, and fatalities), Russell showed that as the duration PTA increased, the incidence of skull fracture, headache, plantars extensor, neck rigidity, retrograde amnesia, memory loss, and nervousness also increased. In a follow-up study that included most of the original population, Russell[11] (1934) reported that while the existence of a skull fracture was unrelated to capacity to resume full work, liability to work incapacity was subject to two factors: age and duration of PTA. Symonds[12,13] (1935, 1936) confirmed the importance of PTA as an index of severity based on his extensive clinical experience. In 1942, Pilcher and Angelucci[14] grouped 373 acute head injury cases according to duration of disturbed consciousness (momentary, less than 1 hour, 1-8 hours, 8-24 hours, over 24 hours, and fatalities) and clearly showed consistent increases in incidence of neurological symptoms in the ascent of this more graduated PTA scale. They concluded that "although the duration of unconsciousness and the duration of any abnormal state of consciousness are both reliable indexes of the severity of injury . . . the duration of disturbance of consciousness forms the most reliable basis for such a classification." Denny-Brown[15] (1942) reported that the duration of PTA and intellectual defects were the most reliable criteria of severity in a study of 400 patients. The rationale advanced by Denny-Brown for considering duration of PTA as an index of severity was "The essential factor that retards or prevents full restitution of cerebral capacity is the generalized cerebral disorder of which the best indices are the duration of true PTA and a residual intellectual deficit" (p. 814). However, in the same year, Anderson[16] reported no relation between length of PTA and severity or duration of symptoms based on a neuropsychiatric study of 150 chronic military cases of head injury.

In a study employing a five point PTA scale (nil, under 1 hour, 1-24 hours, 1-7 days, over 7 days), Symonds and Russell (1943) compared 232 consecutive cases with 718 chronic cases. Although only 20% of the acute group (compared to 50% of the chronics) were invalided from military service, in both groups the proportions invalided increased with longer PTA's, the percentages for cases with PTA's over seven days being identical in each group (60%). In a study of the relationship of head injury to a single symptom, anosmia, Leigh[18] (1943) reported that 72 (out of 1000) cases with this symptom were characterized by longer PTA's, generally reckoned in days. Moore and Ruesch[19] (1944), employing a three point PTA scale (3-9 days, 10-20 days, and 21 or more days) with 39 cases in the acute stage, concluded that "the duration of disorientation proved to be one of the most reliable and easily obtainable criteria of the seriousness of mental prognosis." Persistence of gross intellectual deficits for six months was noted in 31% of the series, all cases with PTA's longer than 19 days. Ruesch[20] (1944) found that psychological tests administered soon after recovery from head injury showed no striking differences between subjects with no loss of consciousness when compared to others with short or long PTA's. However, re-examination of the 90 cases from one to three months later revealed 25 patients with intellectual impairment who were in the longer PTA groups. Reynell[21] (1944) compared psychological test performances of 520 cases of head injuries (95% closed) and 50 neurotics. Although noting a higher incidence of invalidism in cases with longer PTA's (50% for all patients with PTA's of one week or more), because psychological testing permitted differentiation of a group of which 80% were invalidated, Reynell concluded "A positive result on differential testing two or more months after head injury appears to be of greater significance than a PTA of one week's duration." Denny-Brown[22] (1945) with a 4 point PTA scale (0-1 hour, 1-24 hours, 1-7 days, over 7 days) reported that the duration of disability and incidence of mental symptoms in 200 cases, 15-54 years old, increased with the length of PTA. Citing Anderson's negative findings and the belief that it was "too subjective a symptom to satisfy the criterion of objective measurability," Lynn[23] rejected PTA as an index of severity in a neuropsychiatric study of 48

head injury cases and 33 controls. (An interesting outcome of this study was the development of psychological techniques as a differential diagnostic aid in the assessment of psychological effects of head injuries and other forms of cerebral pathology by Levine and Hewson[23] (1949), the psychologists participating in the study. Penfield and Shaver[24] (1945) in a long-term follow-up study of 407 head injury cases ranging in age from the first to the eighth decade reported no significant correlation between the incidence of post-traumatic epilepsy or headache with duration of unconsciousness. Tooth[25] (1947) investigating the sensitivity of mental tests for the measurement of disability after head injury, administered four psychological tests to 100 head injury cases with a diagnosis of "post-concussional state" and to 50 controls. Based on a three point PTA scale (0-1 hour, 1-24 hours, and over 24 hours), he reported a "direct association" between length of PTA and poorer performances in mental tests as well as presence of abnormal neurological signs.

In reports by Russell and Nathan[26] (1946) and Russell[27] (1948) including the results of follow-up studies of surviving cases of head injury, systematic differences in effects of length of PTA on recovery of full efficiency, length of retrograde amnesia, intellectual impairment and memory were further defined. Another study by Russell and Schiller[28] (1949) clearly showed differences in effects on consciousness as a function of the nature of the trauma. Of 15 cases with obviously severe crushing injuries to the skull, only three suffered loss of consciousness. The authors concluded that "the absence of *acceleration concussion* presumably explains the preservation of consciousness."

Tonnis, Loew and Bormann[29] (1949) noted that although cases in which there was no loss of consciousness showed circulatory regulation disturbances, incidence was notably higher in patients with longer periods of unconsciousness. Miller[30] (1949) reported PTA was a rough guide to severity. In a study of children with skull fracture, Probst[31] (1949) defined three types of sequelae: initial due to commotion (lasting only 24 hrs.), commotional psychoses (from a few days to a few weeks), and character and intellectual changes (lasting up to several years). The most distant sequelae, Probst declared, depended upon personal factors. Harrer and Kargl[32] (1950) reported no correlation between age and duration of coma but a clear correlation between the length of coma and work incapacity as well as other symptoms in a study of 153 cases. Reisner[33] (1951) differentiating 1850 cases of unconsciousness (in a population of 3000) on a three point PTA scale, found that cases with unconsciousness for a few minutes showed disturbances lasting two to three months; those unconscious from 15 minutes to three hours, from four to six months; and those unconscious for over three hours, from nine to 12 months. Similarly, Birkmayer[34] (1952) found the duration of initial unconsciousness a reliable criterion for prognosis of late sequelae. The following year, Usbeck[35] (1953) dismissed the occurrence of unconsciousness as an indispensable criterion of brain concussion. A study of 49 cases of concussion and 48 cases of contusion by Lechner and Jenker[36] (1954) concluded that the loss of consciousness and the duration of unconsciousness do *not* reflect the severity of injury.

A positive correlation for the increased incidence of epilepsy (including longer intervals between injury and the first appearance of seizures) with duration of PTA was reported by Phillips[37] (1954) in a study of 190 cases of post-traumatic epilepsy. Based on psychological tests administered five years after head injury to 31 patients with seizures, Dailey[38] (1956) correlated poorer performances in tests of memory and intelligence with the duration of PTA following trauma. Increasing hospitalization time in proportion to duration of PTA was reported by Pia[39] (1956). A unique study, in which the effect of closed head injury was investigated in 128 cases for whom an identical twin was used as a control, was reported by Dencker and Lofving[40] (1958) and Dencker[41] (1958). Using first a two point PTA scale (under 10 minutes and over 10 minutes) and then a six point scale (momentary, 10 min-

utes, 1 hour, 1-24 hours, 1-7 days, and over 7 days) psychological tests and neurological examinations of each pair of identical twins clearly indicated that the degree of post-traumatic disability and the duration of symptoms increased with the duration of PTA.

Gurdjian and Webster[42] (1958) suggested that post-traumatic unconsciousness was probably less frequent in infants because the energy of the blow is dissipated in deformation of the skull. In analyses of data which included 1285 cases of acute injury, in contrast to Phillips, they did not find increased incidence of epilepsy or onset of seizures at a later time as PTA increased. In a one to six year follow-up study of 26 patients with long periods of unconsciousness, Akerlund[43] (1959) used a four point PTA scale (1 week, 2 weeks, 3 weeks and 4 or more weeks). Only eight subjects (all under 24) were fit for work and had no residual symptoms. Akerlund concluded that when unconsciousness lasted for more than one month, grave neurological deficits and invalidism were highly probable. For unconsciousness less than four weeks, satisfactory restitution was found in two-thirds of the cases, the chances improving with youth.

In assessing the results of the diverse studies cited above, differences in populations, the form and content of examinations, the time of observation and the type of PTA scale used are obviously important. Consecutive hospital admissions who were examined promptly after injury in the acute stage differ markedly from populations studied in the subacute and chronic phases of injury. In addition to the selection factors (with increasingly higher incidence of severe cases in clinical populations examined at later intervals), since initial, later and residual sequelae differ, the incidence of any given feature may vary, depending upon the character of the population and the nature of the symptom. As pointed out earlier, cases with focal injuries generally are less subject to long PTA's since much of the force of the trauma was expended in a restricted area. In such cases, as in penetrating gunshot wounds or the above cited study of crushing injuries to the skull, the period of disturbed consciousness is not a reliable index of severity. Fortunately, however, the effects of the concentration of the force into a restricted area often result in obvious focal signs, so that the clinical features and the anatomical data permit a fairly accurate estimate of the degree of severity in many such cases. However, among the studies cited above, not one was found to have carefully screened such cases from the population. It is thus obvious that the findings of the effects of duration of PTA in studies in which these cases have not been excluded are qualified in proportion to their numbers in the population.

A second consistent finding which was unrelated to the thesis of PTA was the importance of the age factor. Indeed, in the original studies by Russell, age was cited as the most important single determiner of prognosis. Although only a single study presented evidence of the effects of age on PTA in cases of head injury (Harrer and Kargl reported no correlation between age and duration of coma), following Russell, older subjects with closed head injuries were noted to show more drastic early as well as late effects by Symonds, Denny-Brown, Harrer and Kargl, and Akerlund. Thus the age factor must also be taken into account, since the findings of different studies may also vary as a function of the different ages of the populations.

The form and content of examinations constitute additional sources of ambiguity. Whether clinical neurological, neuropsychiatric or primarily psychological in character, obviously the results of any examination are largely dependent upon the selection of clearly defined and sensitive variables as well as the sensitivity of the methods of study to accurately measure them. The increasing use of objective psychological tests including both standardized psychometric techniques as well as methods adapted from experimental psychology have provided valuable objective data with the further virtue of being reviewed at a later date or in another place, since many follow-up studies

encounter the problem of relocation of the patients outside their original area.

Since, as Russell[8] observed, the duration of PTA is not an absolute criterion, i.e. many cases with long PTA's showed prompt recovery with no enduring disability, while others with short PTA's revealed persisting symptoms—except for its interest as a statistic, how may we evaluate the significance of the duration of PTA?

For cases without focal signs, despite the few studies with negative findings cited above, it appears to be *the most reliable single index of severity.* It is interesting to note that all of the studies in which an objective PTA scale with absolute discrete intervals was employed reported positive correlations. As the duration of impaired consciousness increased, the incidence of a variety of clinical signs increased. This consonance in findings of the diverse studies reviewed above is all the more remarkable, especially since in addition to population differences suggested above, the scaling intervals for the different studies varied from minutes to weeks. Conversely, not one of the studies that reported negative findings included data based on a PTA scale with absolute discrete intervals. The significance of the duration of PTA is further defined when the age factor is also taken into account; and it may be refined still further by the use of objective psychological tests, since in all studies that employed tests, a further means for differentiating the effects of PTA was reported. By combining the use of psychological tests and refined PTA scales, the differential effects of age and PTA, as well as their interaction can be more precisely investigated.

The conception of PTA as a criterion of severity has important practical and theoretical implications. Essentially, as Russell originally conceived it and as Denny-Brown later confirmed, it means that the length of the interval during which a patient with a non-focal closed head injury is unable to record his experience is directly related to the degree of structural alterations. As noted earlier, this is the underlying basis for the distinction between concussion and contusion. The consistent evidence of the studies reviewed suggests that the prevailing arbitrary nature of this distinction may be more clearly defined, modified—or new and more objective categories developed based on the results of future studies.

The range of clinical features found to be sensitive to duration of PTA has increased considerably with succeeding studies thus far. By including additional neurological and psychological variables, with the use of more refined PTA scales and carefully differentiated populations, the range may be extended still further. The results of such studies may not only afford definitive data for re-evaluation of current diagnostic techniques but also provide evidence bearing on theoretical approaches to the problems of brain injury and brain function.

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Difficulties in Treatment of School Phobia, with Report of a Case

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Recognition of school phobia in psychiatric literature is rather new—little was written about it prior to 1941[2,15] and most such children were referred to truant officers rather than psychiatrists. School phobia as a clinical entity is generally subsumed under the various psychoneurotic disturbances of childhood and adolescence. However, clinicians are well aware that occasionally a youngster who refuses to go to school and becomes panicky when exposed to it, may basically be borderline-psychotic.[4] As Finch and Burks[10] have pointed out, the milder forms of school phobia may go unrecognized as such and without much handicap to the child, as when manifested in refusal to eat lunch at school or frequent but transitory absences from school under the pretext of illness which is not found on physical examination, and with no immediate gain to be expected from such absence as in the case of an ordinary truant child.

Eisenberg[5] suggests a phenomenological definition of school phobia as "partial or total inability to go to school that results from an irrational dread of some aspect of the school situation." He agrees with Johnson's[8,12,13] etiologic analysis of school phobia as a type of separation anxiety (here, on the part of a child for whom school means a dreaded separation from parents), but feels that his phenomenological definition is better because it involves no commitment to an exclusive theory of causation—on which there is still no complete agreement (e.g. Agras[1] and Campbell[3] stress depression in childhood as cause of school phobia). Also, the historically older term "school phobia" emphasizes in a useful manner, the clinical symptom that must be the first target of treatment efforts (i.e. insistence on early return to school).[7] Cases of school phobia are being referred in increasing numbers to mental health clinics,[18] e.g. up to 3% of admissions for all causes in a large University Children's Psychiatric Service[5]—probably due to a growing recognition of this syndrome and the resulting change in the method of management by school authorities and family physicians.

Various characteristics of patients manifesting this disorder are mentioned in the literature, such as the frequently found preponderance of female sex,[10,18] the pseudomature appearance and at least average intelligence of the youngsters which mask their actual emotional immaturity,[6,10] and the significantly poor recovery rates noticed in patients past the age of eleven and in cases where the child has been out of school for more than three or four months.[7,16]

Regarding the dynamics of this syndrome, it is generally agreed that usually, long before the symptom of refusal to go to school becomes manifest, the emotional tie between the child and one of his parents—as a rule, the mother—evidences abnormal closeness and ambivalence.[8] These features can often be traced in a given case to significant events in the past life of the family, such as severe parental discord, death of a family member, mother's own immature attitudes—events leading to an inadequate gratification of the mother's own emotional needs. In such a setting, any incident momentarily making the child anxious (illness in the family, being scolded by teacher, being teased by compeers, etc.) is likely to increase the child's regression and dependence which, in turn, are likely to be exploited by the mother through subtle communication to the child, of her unconscious desire for such intimate relationship of increased dependency. Eisenberg[5] has described particularly well the contradictory verbal and behavioral clues offered by such mothers, as when every ad-

From Marion County Mental Health Clinic, Marion, Ohio.

vice is met in the presence of the child with anticipation of failure ("and what do I do when that doesn't work?") or a child who, in a preoccupied fashion, walks away from the mother to observe and join his schoolmates is met with, "How can she treat me like this?" The child becomes afraid of his own hostile impulses which his mother has proven ineffectual to check; he cannot leave home because he is anxious about what may occur during his absence from the home. His fear typically becomes displaced onto some element in the school situation and thus a phobia comes into being. In reality, the school situation itself very rarely is to be blamed for the child's fear.

Since its recognition, the problem of treatment of school phobia has presented a great clinical challenge. On one hand, there was in existence a severe handicap to the child who by virtue of non-attendance at school, would lag further and further behind in his studies. On the other hand, the treatment results obtained by traditional uncovering psychotherapy with the child combined with case work with parents were generally rather discouraging, with treatment lasting from a few weeks to 2-3 years.[18,21] Many clinical observers acknowledge that the traditional permissive attitude toward the neurotic symptom itself (emphasizing insight before action) is not helpful in school phobia. On the contrary, before any further treatment or improvement can take place, it is necessary to use positive firmness in cooperation with parents and the school authorities to insure the child's physical presence in the school building. This must be accomplished without delay and without waiting until any particular insight is achieved, even though the importance of securing such insights at a later time is not denied.[5,10,14,16,17]

Talbot[18] points out in this connection the modification of technique suggested by Freud in treating phobic patients in general: after initial "loosening" of the patient's feelings, the therapist is to actively intervene, urging the patient to meet his fear in order to bring the conflict into the open.[9] In doing this, the therapist urges the patient to action (here: entering the school building) without necessarily waiting for emotional insight on the part of the patient into the unconscious determinants of his irrational fear. Some investigators, however, have attempted to prove with their statistics that the long-range results with children who were quickly returned to school, and who were seen simultaneously with their families for not more than five or six interviews, were as satisfying as could be reached from any prolonged therapy.[16]

From our experience, we believe that successful treatment of a fully-developed case of school phobia is most difficult in a small community where there is generally little recognition and acceptance of the facts of emotional illness and where, therefore, it requires considerable effort to establish the professional team cooperation that is a necessity in such cases. We believe that the following case adequately describes such difficulties and also presents a few unusual features of its own.

A Case Report

Mary K. was referred by her parents to a community Mental Health Clinic at the age of nine years, seven months, in September of 1958, because of her refusal to go to school which had been manifested intermittently for the previous three years. In December, 1955, Mary's family had suffered a tragedy in that the mother's second pregnancy, which was announced with great expectations to the child, ended in a still birth. For two and one half weeks Mary continued to go to school but appeared very sad, cried at every bedtime, and the first-grade teacher told the mother that Mary seemed very unhappy when she had to tell other boys and girls that the expected addition to the family had not materialized. Then came the Christmas vacation, and after the vacation was over, Mary appeared too frightened to go to school. She stayed away from school for about three days and then, with a lot of coaxing from teachers and parents, went back and attended school the rest of that school year. Things seemed to go well for the first half of the second grade, but again, at the end of the Christmas vacation, Mary refused to go to school. This time, despite extreme battles with parents and teachers, the child did not return to school for the remainder of the second grade. In January 1957, Mary was referred to the school psychologist who noted in his report that the mother stated several times in the child's presence, that they could not understand her behavior and did not know what to do about it. The parents' behavior

gave the impression that they were trying their best to control Mary but that they were not sure they could control her. The child appeared to sense this indecision and was doing as she pleased.

In the second half of the second grade, under the guidance of the school psychologist, several forcible attempts were made by school personnel to transport the child from home to school while she cried, screamed and kicked. She ran back home as soon as she was physically released and these attempts were abandoned.

Early in 1957, Mary was taken into treatment by a psychiatrist in a nearby metropolitan city. This psychiatrist wrote to the school in March, 1957, stating that he would be quite willing for Mary to stay at home as an ill child while she was being treated. A tutor was hired for the remainder of the school year. With his help, Mary was able to start the third grade in the fall of 1957. This time, the refusal to attend school manifested itself earlier in the school year, that is, shortly before Christmas. Now once again Mary stayed out of school and was tutored at home and the psychiatrist wrote to the school in April of 1958 that "Mary is making nice improvement but still shows not the slightest interest in school. It is a situation in which she cannot be made to attend school. However, I am quite certain that she will be enrolled again this fall." By this time, the school authorities became seriously concerned about the group situation in which other children might prefer not to attend school. The parents and the teachers were dissatisfied with one another, and the parents were nearly equally dissatisfied with the psychiatrist who, they felt, gave them only repetitious platitudes of "being firm but gentle" with the child that did not help them in any way. Following the already apparent pattern of a spread in the symptom, Mary's reluctance to go to school in the fourth grade took place in September (1958) and this time the parents came to the local Mental Health Clinic which had just been activated.

A social history was obtained at this time. Mary's birth and early development were non-contributory in terms of psychopathological inquiry.

She started the first grade at the age of six and it was then that the mother became pregnant again. The mother felt that perhaps the parents went overboard in telling the child right from the start that she was going to have a baby by Christmas. Mary seemed overjoyed as prior to that she appeared to be longing for another child in the family. She was quite shocked when told about this baby's death.

At the time of the initial examination in our clinic in September 1958, both parents made a striking impression. They were in their thirties but the mother looked physically much younger and was conspicuous by her impulsiveness, indecision, quickly changing attitudes, proneness toward easy upset, great insecurity and doubt in her own capacity as a mother (for this, she blamed the past history of problems with the child) and generally appeared quite immature. The father took little part in the conversation but simply sat with a skeptical look of disbelief and resignation on his face, making it clear that while he was willing to go through all this procedure, he doubted if anything could be achieved. Both parents denied any family history of nervous and mental illness. After three years of intermittent difficulty with the child's going to school, the parents were still finding it very difficult to accept the idea that the child was emotionally ill and that it was Mary's feelings which were troubled and not something in the school situation that was to be blamed.

For a long time, the mother assisted Mary in her attempts to conceal her absence from school from other acquaintances and neighbors. The mother herself observed that Mary treated each parent differently on days she would refuse to go to school. She would announce this in the morning in such a way that her father would not hear it—that is, deliberately choosing a moment when he would not be present. She would try her best to avoid admitting this refusal in the presence of the father. When the mother would then try to reason with the child about going to school, Mary would usually say something to the effect of "you don't love me" and then cry. Both parents, in turn, seemed to be on a continuous lookout for the first symptom or sign that on a certain morning, Mary would not go to school. As soon as this appeared, either in the girl's being moody or by announcing her fears, the parents would quickly announce it to each other with a tone of "I knew it was coming" and immediately, arrangements relevant to school attendance would be called off. In this respect, the child's father was particularly conspicuous because when describing how "he knew at that point that Mary was not going to go" he would grin very pleasantly as if the appearance of trouble for which he was watching, was not all trouble but was in some way pleasant at the same time.

Prior to the referral of the child to the Clinic, the parents seemed to be totally unaware of any other odd behavior or nervousness on the part of the child outside of the refusal to go to school and only later in retrospect, was the mother able to relate other difficulties. (The father never, in our contacts with him, quite came to the point of actually recognizing these other problems.) According to the mother, Mary's behavior was different at those times when she was not in school and "felt low." The mother also stated Mary would "follow her around the house like a puppy." At other times, she would deliberately needle the mother, getting embroiled in arguments with her over something for which Mary had asked and which was promised but was not done. The mother, for a long time, felt exasperated in her attempts to reason with Mary. There apparently was a great deal of diffi-

culty also, in inducing Mary to do such things as stay in a Brownies' Camp, attend a Bible School or stay overnight with her girl friend's family; and thus the child's anxiety seemed to be mobilized by all situations involving separation from her family.

When Mary was first seen at the Clinic, she presented herself as a well-developed girl, but somewhat short for her age of nine. The most outstanding impression about her was the depression visible in her face and eyes. She seemed timid, hesitant and shy, remaining silent most of the time. She came near to crying when the suggestion was made that she looked very unhappy. Despite her generally depressed and inhibited behavior, she was obviously in good emotional rapport with the examiner and our diagnosis was that of psychoneurosis with phobic and depressive features.

Mary was taken into treatment and in the first phase of it, was seen weekly for a total of seven visits through the end of October 1958, at which time it was discontinued by the parents who felt certain that there was no more need for it. Since they had never relinquished the idea that Mary's behavior was based on a real difficulty presented by the particular school environment, they took their first opportunity within a couple of weeks to change schools by changing their residence. The fact that in the new environment Mary started going to school, seemed to them only a further confirmation of their suspicions. The move was made without consulting the therapist—in fact, the therapist cautioned them that an emotional illness of this type is not likely to subside so easily but it did not seem feasible to try to force treatment upon them.

During this first phase of treatment, Mary was seen for half-hour interviews at the start of the hour and later, one of the parents was seen in case work for the remaining half. When feeling more relaxed, Mary would very obediently come into the office, sit in her chair and look around, sometimes fingering a toy with the expression of a person who just has to put up with something that is senseless and unpleasant, but unavoidable, so she is agreeable to go through the motions. At times, when her tension was apparently greater, she remained almost totally silent. Occasionally, when she felt better, she would speak spontaneously and at such times, would bring in a succession of stories of little minor incidents which had happened at home or with her playmates or what she saw on TV. These stories sounded as if she discussed them merely out of a feeling of obligation toward the therapist and most of the time, it did not seem possible to discern any expression of her own feelings behind such stories. At no time did she actually make any attempt to involve the therapist in a game or to express her feelings although there had been plenty of opportunity for that.

The second phase of treatment started after a month's interruption at the end of November 1958, when her parents came back quite frantic—Mary had again refused to go to school. From this time on, the child and the parents (most of the time, the mother) were seen every week except for several months in the summer of 1959 when they were seen once in two or even three weeks. A total of 33 hours of therapy had passed by December 1959—as will be described below—before, with a new approach, the third and last phase of treatment was started. We were initially quite impressed with the chronicness and severity of this case as well as by the chaotic and disorganized background of previous attempts at help. For this reason, it was decided in contacts with Mary to attempt to build a relationship with the hope that eventually, on the strength of this, Mary would become more spontaneous and less inhibited in the presence of her therapist. This hope was not realized as regards any expression of her feelings although she eventually came to speak a great deal at times in that above-mentioned fashion of dutifully reporting her recently observed or heard stories.

After a psychologist joined our Clinic staff, psychological testing was done in May, 1959. The most outstanding deviation on her Rorschach Profile, from the average child her age, was in her increased assertiveness. Along with this assertiveness, some hostility was found. Thus, we appear to have some test evidence for her strong resistance to the efforts of others who try to get her to go to school and for her tendency to "needle" her mother. She appeared to be somewhat more stimulated by emotional contacts with others than is the average 10-year old. Her response to this stimulation, however, tended to be more controlled and less impulsive. Thus, we seem to have had a little girl who was interested in other people but one who did not feel free to "let herself go" in their presence.

Along with this controlled extroversive tendency, her inner resources for adjustment and buoyancy or drive, seemed to be somewhat inhibited. Likewise, her general productivity, in terms of the number of responses she gave, was somewhat less than average. A below average tendency to approach problems in a practical way was in evidence. Some anxiety was found to be present. This, of course, does not give one the picture of a girl who would be inclined to try to free herself from a school phobia.

On the Thematic Apperception Test, Mary showed considerable interest in babies and in people having children. She even saw young people escaping from home to get married and have children. In one instance, she saw a man who threatened to leave his wife—but later, he was glad he did not because of the resulting children. She saw herself as more interested in a doll than in books. Thus, we have some test evidence pointing toward the significance, for her, of children and babies, which would tend to emphasize that the death of her mother's unborn child must have been quite traumatic for her. She

saw the adult female figure as being fearful and, at times, angry and as a disciplinarian—in general, a negative figure. She saw the adult male as threatening rejection through desertion on the one hand but protective on the other hand, when confronted with another's fearfulness. She also saw him as a combatant of evil—in total, a somewhat more positive, but still threatening figure in comparison with the adult female. She saw herself as hostile but also as suffering feelings of guilt, and in the end, as capitulating.

As regards Mary's school attendance during the second phase of treatment, the attitude was adopted that there was to be no physical coercion toward keeping her in school but the parents were encouraged to feel free to express to the child their conviction that her place is in school. This decision was made partly because of the previous history of unsuccessful forcible attempts to keep this child in school and the above-mentioned long-standing nature of the problem which seemed to have degenerated into an endless battle between the parents and the child. In that respect—as will be seen below—this attitude was a mistake and in itself, probably contributed to another school year of "unsuccessful battle." Mary did not go to school for the remainder of the 1958-59 school year but since she was now under a different school board, the previously expressed threat of the school's refusal to accept her back was no longer present.

Interestingly enough, the hope cherished in this type of treatment (the usual psychotherapeutic attitude of "wait and see")—that the child eventually would become less anxious and arrive at the point where going to school would come fairly easily with no "battle"—did not come true. Yet at the same time, all other symptoms of emotional disturbance did improve. This improvement was noticed at home in that Mary became more able to absent herself in going to stay overnight with her girl friend's family. She went to the Brownie Camp daily in the summer of 1959. She went to Sunday Bible School where she was exactly like the other children, according to the statement of her Sunday School teacher. Toward the spring of 1959 and even more during the summer, the mother began to remark spontaneously how Mary was changed in her behavior at home. The cranky, irritable attitude toward the mother was subsiding and it was possible for her to discipline Mary without the appearance of the morbid resentment on the part of the child which used to be so typical of her. By May of 1959, the parents as well as the therapist, felt sufficiently encouraged by this progress to start again urging Mary to go to school. A preparatory conference was held with the school teacher and the principal. Here again, in retrospect, it would seem that as a part of a generally erroneous attitude, the idea of not setting a certain date for going to school but rather, as it were, leaving it up to the child, was in itself, a mistake. Mary kept telling her parents that "she would go to school in September." Although she eventually did this much, it can hardly be ascribed to the influence of treatment since in previous years she had gone back in September, but just for a limited period of time.

A preparatory conference with Mary's schoolteacher was again held early in September of 1959. Once more, Mary started going to school with no seeming difficulty. Her teacher recalls her behavior in those days as follows:

> "Mary looked to me to be as normal and well-adjusted as any of the other children in her class. She seemed eager to please me at all times, in a shy, quiet way. During this time, she maintained above average grades and was well-liked by her classmates. She never was a discipline problem.
>
> Mary particularly enjoyed the sharing period during the day when she showed the class something she owned or told them of an experience she had had, usually pertaining to her family. She gave no indication that she disliked school in any way and she seemed interested in the things presented. Truthfully, it was hard for me, at this time, to believe that this child had a problem."

Unpredictably, there were two days of refusal to go to school in late September; no such difficulties were apparent in October, but in November, scattered absences of a day or two each combined to a total of 25% of school time. Immediately, the parents, especially the father, became panicky; the father talked of wanting to hire a tutor again. Alongside the school symptoms the mother again noticed a return of an argumentative and rebellious attitude on the part of Mary toward her. Still, as far as the mother was concerned, the total picture looked less morbid than it had in previous years. In contrast, Mary's attitude toward her father at this time was kind and pleasant; at the same time, the father denied noticing any of these emotional points brought up by the mother. The therapist then decided to involve another therapist, a psychologist, for case work with the child's father, hoping with this approach for a better chance to overcome the new crisis.

The psychologist reported that in their interviews, the father presented quite a negative picture. He reported that he had seen no improvement in connection with their problem since the first time they sought psychiatric help, even though everything had been tried. Further, he saw no hope for the phobia. He had determined to employ a tutor for the girl within a few weeks unless a change was seen. No insight into her difficulty was in evidence. He felt that there was a reason why the girl wouldn't go to school; that she would not give the reason; and since she had not given it thus far, they probably would never be able to find it out. He thought that he was seen by the other therapist as the main cause of the girl's problem. Also, he voiced some resentment toward the other therapist at what he felt was criticism toward him and his wife each time they came to his office.

At that time, he seemed to take the girl's refusal

to go to school mostly as a matter of course. He didn't punish or criticize her for it or try in any way to get her to go. An exception to this had occurred at that time when he spanked her once when she wouldn't go to school, but, he added, "That didn't help any either."

Early in December 1959, with Mary's absence from school again continuing in one long stretch, it became once more apparent that we were losing ground in treatment and that, in view of this, the whole planning for this child had to be revised and re-evaluated.

In an effort to overcome the therapeutic stalemate, a consultation was arranged with a nationally-known child psychoanalyst from a nearby university medical center. As a result of this consultation, in the middle of December 1959, a new approach was outlined to the parents for their agreement, if they would intend to continue their child in treatment with the Clinic. The essential change in the new approach was that the therapist, instead of maintaining his previously permissive role of a counselor with parents, would initially assume a very omnipotent role with the power to make decisions for the parents and for the child on all points concerning her problem of school attendance, and that the parents would promise ahead of time, to obey these decisions unhesitatingly in each and every situation that might arise, without permitting themselves the expression of any doubt. The parents were told ahead of time that all of these decisions would invariably support the basic decision that Mary was to be at school every day if only for a few minutes, regardless of whether she would spend this time in a classroom or in the school nurse's office or in the principal's office or in the corridor or anywhere in the school, and she would still receive each time, a full workload assignment of her class on days when she would not finish it in school. The parents were told that if they agreed to work with the therapist from that time on, the doctor would temporarily take over the role of parent which they actually had lost in the struggle with the child—and if they would not agree to it, then we would refuse any further responsibility for the child's treatment. They were offered a very close contact with the therapist who would be available to them for immediate telephone consultation at any time.

After a few days of hesitation, the parents agreed to cooperate with this new approach. Cooperation was then secured once more from the child's teacher. This was particularly necessary since frequent interruptions of classroom routine were initially to be expected in this somewhat unusual situation and explanations had to be made regarding why it was to be done in that way. Similarly, the school nurse and the child's pediatrician promised, at our request, to investigate any complaints of physical illness on the part of Mary (on the spot if in school or by a house call made early in the morning), since it was anticipated that such excuses might be used by the child during the initial difficulty. While actual physical illness would be treated by all proper means, in the absence of such, the child would immediately be sent to school. The parents at this time understood clearly that the child was not to have any secondary gain during the time she was not in school. This did not mean punishment but simply that by virtue of not being in school, she should not have the privilege of doing those pleasant things which other children in school could not do during those hours (watching TV, etc.). The parents furthermore, were instructed to answer any inquiries on the part of the child as to the "why" of these decisions (such inquiries it will be recalled, were typical of her during the endless struggle in the family) with the simple statement that such is the decision of the doctor. They were to absolutely avoid any other lengthy reasoning, no matter how many doubts of their own they might have. All this preparation of the parents, the school authorities, and the family physician was done within a week, unknown to the child, and a date was established ahead of time on which this plan was to go into effect. In order to make sure that the parents really understood what they were to do, the situation was literally rehearsed with them until it was felt that they were prepared

Thus, the third and last phase of treatment of Mary was launched on January 4, 1960 when, early in the morning, Mary was told for the first time by her therapist that from now on, he would be in charge of her school problems, and that since those problems had become quite a mess he would have to straighten them out. From now on, she would go to school every day starting this very morning right from the doctor's office. Suggestion was made that although she would probably feel angry with the doctor for doing this, still, deep inside, she probably had wished for a long time for someone to finally straighten out this trouble. The child remained silent as usual in her difficult moments. The parents were seen once more also, and in her typical fashion, the mother had many worrisome questions to ask: what would happen if Mary would run out of the school without her coat and hat on; what would happen if Mary would immediately turn around and run after them the moment the parents leave her in school; what would happen if the school would not cooperate exactly in every detail, etc. We refused to go into the details of these worries with the parents. We simply told them that we could offer nothing now to take their worries away but that we were surprised that they have as many worries concerning their girl who is close to 11 as they would have if she were only 3 or 4. The child's parents were reassured that it would not be necessary to take Mary back to school the same day even though she came back before school was dismissed; just so she would be there for a brief period of time. This led to their

worrying in terms of "what will happen if Mary finds out that you are not insisting on her going this second time in a given day?"

Within one-half hour after the family's departure on the first day the plan was put into effect. The mother telephoned and stated that they all were at school but it took all the power her husband had to hold Mary down in the building. "What shall we do now?" We answered unhesitatingly that they were to proceed to the door of the child's classroom, open the door, apologize, let Mary in, close the door, quickly walk away, get in the car and drive away without looking back. Characteristically, at this point, the mother asked, "What do we do then if she starts running after us?" She was promptly reminded at this point of her promise to do things exactly as she was told by the doctor, without doubts or questions and she quickly gave up the questioning.

Mary's teacher made at this time the following observations:

"Mary returned to school under great protest on her part. Her classmates were very kind to her and eager to help. She did not accept their kindness too freely at first, perhaps because of her behavior.

"For a little over a week, she stood by the door of the classroom after being brought to school by her father. She would stand there until recess while I stood close by. After recess, she would return to her seat on her own accord. After lunch, she returned to school by herself and seemed to be a completely different person. Her grades continued to be above average. After a period of time, she was more at ease and relaxed and the frightened look she had had previously, was gone."

When seen one week after the start of the new approach, Mary seemed more relaxed as did also her mother. The mother admitted that the worst part of this procedure was not so much the procedure itself but rather, the expectation of it and the thoughts they had as parents, while waiting for it. She admitted she was quite surprised that it worked so well; by that time in the morning they still had to exercise the actual supervision of going with her to school but it was getting easier, and the time seemed near at hand when their accompanying her would not be necessary anymore.

Actual physical coercion on the parents' part was necessary only on the first two mornings of this new approach. By the end of January, the mother seemed positively elated over what she described as a very normal atmosphere at home. For the first time in years, with the child now quite willingly going to school, and there being no problem in managing her anymore than any other girl her age, the mother seemed confident about the future of the child's progress even though, intellectually, she realized that there is no guarantee for the future. In view of the mother's relaxation it was now possible to look more deeply into the family relationship and family history, to a degree which was difficult if not impossible, before. One of the mother's statements at this time was, "I guess we were so confused and so worried about so many things after such a long time that someone finally had to tell us what to do." The interviews were spread now over longer periods of time and were terminated on March 7, 1960, only six interviews past the time when the new approach of this third phase of the treatment was started. By this time the child's mother recognized a change within herself in that when Mary would become "whiny" the mother would simply say "no" to whatever unreasonable demand the child presented and the "whining" would soon cease. This was in contrast to the mother's previous attempts to reason with the child which would get both of them nowhere. The child herself continued to appear quite relaxed and for the first time ventured to play checkers with her therapist.

After the new approach was instituted and the girl was going to school, the father was still pessimistic about the future. He felt that they would have reoccurring trouble all through school in getting this girl to go regularly. He also continued to mention that he didn't think the cause of the problem could be discovered.

He took her to school each day at first, always anticipating the worst. If the teacher was not in the room when he arrived, he waited for her to return so that Mary wouldn't run out of the room. He was also worried about the possibility of a shift in the phobia from morning to afternoon; and so he also took her to school every afternon.

The therapist worked with him in terms of getting him to gradually relinquish his close supervision of her going to school while also encouraging the father to develope more of a social life for the family. The father took action on all of these points. As he did so, he reported that Mary appeared more relaxed and to be developing more of an interest in school. He also mentioned that his wife was enjoying their new life. During their last visit to the Clinic, he told the therapist that Mary was enthusiastically anticipating studying a musical instrument in school. He also reported that he now felt that the problem was whipped and would not reoccur.

Mary's teacher described her behavior during the remainder of the school year as follows:

"Mary continued to make good grades. On the days of her appointment with the doctor, she was increasingly concerned with what we would be doing in class while she was gone. I went over the assignments with her, even to the art work for the day. This seemed to please her and this is the time I noticed a very pleasant change in Mary's personality. She was more friendly, happy, relaxed, still a little shy, and even somewhat ornery at times. This was certainly a different girl from the one I first knew at the beginning of the school year, I could see that now."

Discussion

One relevant question concerning this and similar cases is whether the treatment offered this girl in what we delineated as

Phase 2 (from Sept. '58 through Dec. '59) was of any essential help. We felt that it was, although in a way which was not the most essential one at that time, and that it led to an improvement in the child's attitudes at home and lessened the inter-personal tensions within the family. It did this only temporarily, however. Meanwhile, the basic severely handicapping symptom of not attending school remained in existence with all its realistic consequences in the child's life. In retrospect, we feel that it would have been much more efficacious to apply the approach of the third phase of the treatment of this case right at the very start of our contacts with the child and her family, and then the other insights with the parents concerning their expectations from each other in the home situation, would in all probability, have to be worked through later. Very probably it could then be done in a much shorter time than it took in this way. Certainly the authors of this paper will have no hesitation in proceeding in this manner in the future in the case of any child with school phobia unless that child shows some definite signs of a psychotic reaction or borderline-psychosis that would be impending if such a demand were to be placed upon the child.

There is another interesting sidelight in this case which, in our opinion, probably has occurred in such cases in other small communities. In the first year of her disabling symptom, the child was forcibly taken to school under the guidance of the school psychologist and with the ostensible cooperation of her parents; yet to no avail as regards the disappearance of the crippling anxiety. Why was this so? We feel that the crucial element in this initial rapid approach should not be forcing the child back to school, but rather that there be one person in command of the situation, to whom all the others involved will pledge cooperation and to whom the parents particularly, would have to relinquish their endless worries and doubts. Such an agreement was not worked out previously in the case of Mary. Thus, the interference of the school authorities in forcing her to go to school, despite the cooperation of her parents, merely meant another external attempt at coercion. The child with such a severe problem in effect ignores and denies the school set-up as a part of reality, and only the unified approach centered on the person of the therapist will make such a denial of reality impossible.[11] Then, once the child is in school, psychotherapy can be started and can be rapidly effective.

An effort was made above, to show how a therapeutic approach different from the usual psychotherapeutic techniques was necessary in a case of school phobia to bring about essential improvement. If such is the case, is it because school phobia as a phobic reaction, is different from other phobias of childhood? The only apparent difference is the one which has to do not with dynamics of the phobic reaction, which are the same, but with social consequences of not attending school.[10] With every day of non-attendance, the child is set back a step further as compared to his peers. This is not so with other phobic reactions where being afraid, for instance, of certain animals or of a storm, does not continuously handicap the child in an accumulating fashion and thus, time can be taken for therapy amidst a more permissive attitude toward the symptom. However, as was noted above, with all types of phobic reactions in childhood as in adult life, the time arrives in treatment when in view of his increased strength, the patient—if he had not done it himself by that time—is urged by the therapist to make the necessary effort and challenge his fear.

A hopeful light is shed by our case on the concern voiced in the literature that after some three or four months of not attending school because of phobic symptoms, the child's symptom becomes so entrenched that future efforts at therapy have a much poorer chance of success. In the above-described case of Mary, a total of 18 months were missed by the child because of her phobia in the course of 3½ school years and yet with the suggested approach, all the severe difficulty dissipated within several days and there was no need to continue treatment af-

ter two months (six interviews with the child and the parents).

It would seem that factors other than the duration and kind of the symptom are of greater importance, such as the basic ego strength of the patient, the degree of cooperation received from the parents and the school authorities, and possibly also the age of the child, and his natural intellectual endowment. Where parental motivation for helping the child overcome this symptom is poor, legal measures of the local school board supported by the state laws can apparently be successfully utilized to increase the motivation of the parents.[6] In our case, the parents evaded this pressure by changing their residence and thereby, the child's school, but this cannot always be done so easily. Similarly, the cooperation of the family doctor is very essential; it will most often be necessary, as it was in our case, to explain to him fully why any certificates excusing the child from school attendance—unless on the basis of a well-documented and sufficiently severe physical illness—will be detrimental to the child's welfare.

Summary

School phobia as a fairly common and severely disabling type of neurosis of childhood requires, at least in its initial phase of treatment, a very direct and active psychotherapeutic approach with involvement of the parents, school authorities and the family physician. The details of such an approach are outlined on a chronic and severe case of school phobia in a girl who missed nearly eighteen months of school between the ages of seven and ten and yet lost the symptom very quickly when the suggested approach was utilized after a previously lengthy and unsuccessful treatment with the traditional permissive approach.

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Studies on Serum Protein Fractions from Mongoloids

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The concept of molecular disease[1] indicates that many diseases are associated with subtle physical or chemical changes in protein structure. Such changes as these might produce a biochemical lesion. The discovery of such a lesion in mongoloids could conceivably result in a better understanding of this anomaly. Furthermore, in view of the recent findings that mongoloids have an extra chromosome,[2,3] it would appear valid to examine this condition in the light of the concept of molecular disease since the chromatin material is mainly nucleic acid. Nucleic acids are involved in protein synthesis.

Some investigations on serum proteins in mongolism have been reported. Electrophoretic studies[4] reveal a decrease in albumin and an increase in γ-globulin. This has been amply confirmed[5] although the significance of this finding is not known. It has been suggested[6] that the increase in γ-globulin is acquired post-natally since it was not found in two newborn mongoloids examined.

The present study was undertaken to explain the findings on serum γ-globulin as well as to investigate mongolism from the point of view of a molecular disease. Specifically, an investigation of the ultracentrifugal patterns and the amino acid composition of γ-globulin isolated from the serum of mongoloids was carried out; in addition, a study of the γ-globulin from normal and non-mongoloid mentally retarded was made. Further studies were also made on amino acid composition of other serum protein fractions.

Method

Continuous-Flow Electrophoresis: All operations for fractionating serum proteins were carried out using the Spinco model C-P continuous-flow paper electrophoresis apparatus. A typical experiment consisted of pooling samples of serum from 27 mongoloids and dialyzing with stirring against veronal buffer H 8.6 (μ 0.02) over night prior to electrophoresis. Pooled samples from 12 normals and eight non-mongoloid mentally retarded were handled in a similar fashion. Fifty ml. samples were then subjected to electrophoresis at the rate of 1.5 ml. per hour. A constant current of 50 mamp. and 500 volts was applied across the curtain. The fractions were collected at the lower edge of the curtain into 32 tubes.

At the completion of the experiment, the filter paper curtain was removed, dried at 105°C for 20 minutes and stained with bromphenol blue. This technique gave a rough indication of the location of the separated fractions in the various tubes. The contents of the 32 tubes were each placed in a dialyzing bag and pervaporated to 5-10 ml. Aliquots (.006 ml.) of each bag were then subjected to paper electrophoresis according to the hanging strip technique at pH 8.6 (μ .075) for 16 hours in veronal buffer at 9 mamp. Subsequent staining with bromphenol blue and analysis with the Spinco analytrol were carried out. In addition, an aliquot of the unfractionated serum was subjected to electrophoresis. In this manner, the contents of the bags representing each of the 32 tubes were identified as albumin α_1-globulin, etc. by comparing them with the electrophoretic strip of the original serum.

In some cases, 0.5 ml. of a 5% ninhydrin was added to 0.5 ml. from each of the tubes. Subsequent heating at 100°C followed by cooling and the addition of 4 ml. of 50% propanol produced a color which was read at 540 mμ in the Beckman DU. A plot of the optical density on the ordinate with tube number on the abscissa gave results similar to those obtained by paper electrophoresis.

Paper chromatography: Aliquots of each tube corresponding to 5-20 mg. of protein were hydrolyzed in a sealed tube for 24 hours at 105° in 6 N NCl. Spots from these hydrolyzates were applied to Whatman #1 pa-

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per and irrigated first in 80% phenol in H_2O and then in butanol-acetic acid-H_2O (4:1:5). Drying and subsequent spraying with 0.5% ninhydrin in acetone revealed the characteristic amino acid spots. Identification was made by comparison with known amino acids chromatographed at the same time. All samples were run in triplicate.

Ultracentrifuge technique: After pervaporation, the concentrated protein samples were refrigerated until prepared for centrifugation. Aqueous merthiolate was used as a preservative. Dilutions for centrifugation were made using a barbituric acid-sodium diethyl barbiturate buffer of 0.02 μ. Total protein analyses were performed on all samples.

The double compartment cells of the Spinco Model E Ultracentrifuge were used in all analyses with 0.43 ml. of the γ-globulin solution placed in one compartment and the baseline buffer placed in the other compartment. The cells were placed in a precooled rotor prior to evacuation of the rotor chamber preparatory to centrifugation.

The operational speed of 50,740 rpm. was used for all samples. A minimum of five and a maximum of six minutes were required to accelerate the rotor from rest to the operational speed designated. A minimum of 90 minutes were required after 50,740 rpm. was reached, for the components under observation to move from the meniscus to the bottom of the cell.

Results

The criteria of purity and identification of the separated fractions from the continuous electrophoresis is based on paper electrophoresis. Figure 1 is a schematic representation of the results in the case of normal serum. Essentially similar patterns were obtained in the mongoloid and non-mongoloid groups.

Typical patterns of the ultracentrifugal analysis are shown in Figure 2. These results would indicate that there is no difference in the gamma-globulin as isolated from the three sources. In some patterns the macroglobulin component[7] was noted as well as the 9 S component. Further substantiation of the similarity of the three globulins

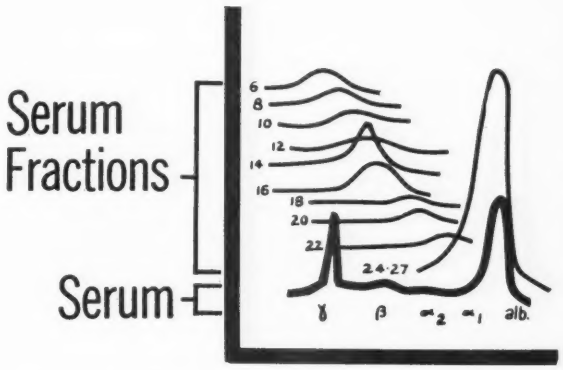

Fig. 1. Analytrol scan of paper electrophoresis of normal serum fractions from continuous flow electrophoresis.

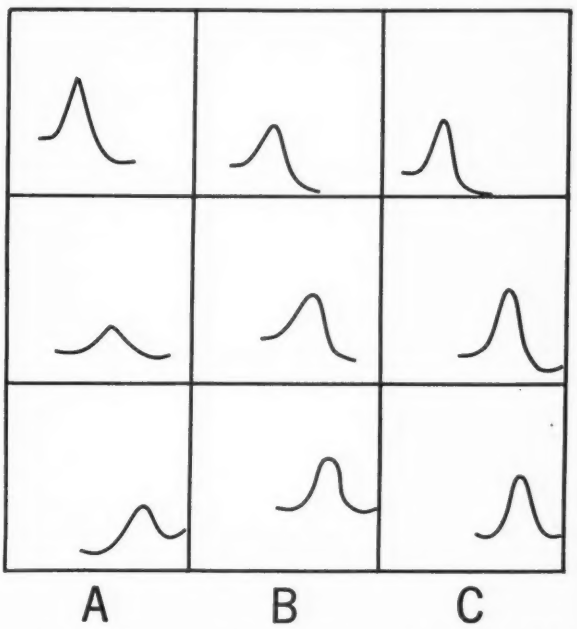

Fig. 2. Ultracentrifuge patterns of serum γ-globulin. A—normal. From top to bottom intervals in minutes between exposures are 24, 56, 85, protein concentration 0.5%. B—non-mongoloid mentally retarded exposures 24, 64, 80, protein concentration 0.62%. C—mongoloid exposures 24, 64, 80, protein concentration 0.57%. Operation speed 50,740 r.p.m. The direction of sedimentation is to the right.

is demonstrated by the sedimentation coefficients. These are essentially 6.4-6.6 S at 20° when extrapolated to zero protein concentration and corrected for temperature, viscosity and density.

Paper chromatographic analysis of the isolated serum proteins from the three groups are essentially the same. Likewise, the amino acids noted here for normals agree with those reported in the literature.

Discussion

Changes in disease may be the result of an alteration in the structure of protein molecules rather than a change in chemical composition. However, under the experimental conditions outlined above, it would appear that the γ-globulin from normal, non-mongoloid retarded and mongoloid is the same. This conclusion is based on the evaluation of the ultracentrifugal patterns of various protein concentrations. The patterns exhibit one component other than the 9 S or 19 S fraction whose characteristics are similar. Additional evidence for the similarity is supplied by the qualitative constancy of the amino acid chromatograms of the isolated serum protein hydrolyzates. These chromatograms indicate that the amino acids from the three sources are qualitatively the same.

The origin of the increase in γ-globulin reported in mongolism can be inferred from the amino acid patterns. These chromatograms suggest that the increase in γ-globulin is attributable to normal blood constituents and is not the result of any qualitative amino acid change in the protein molecule. Further, all components from the pathological sera resemble their normal counterparts. Deutsch and Morton[8] have reported similar results in macroglobulinemia. These authors noted that only minor differences appeared in β and γ globulins and intimate that the elevated proteins merely represent an increase in normal serum entities.

Since the principal interest in this study was the investigation of proteins of mongoloids, the amino acid composition of the other isolated plasma proteins is of interest. Paper chromatography of the hydrolyzates suggests no qualitative differences in any of the fractions from the three groups studied. These results would be anticipated from previous studies[5] indicating a striking similarity in the free amino acid composition of serum from mongoloids and normals. Cummings and Flynn[9] noted no gross or characteristic alteration in pathological sera in the albumin, or various globulin fractions although minor deviations were observed in individual cases. They concluded that little change in the composition of γ-globulin was apparent in spite of its increase in concentration in various diseases.

The findings reported here do not invalidate in any way the application of the concept of molecular disease to mongolism since plasma proteins as such represent the physiological state of the organism as a whole, and thus subtle changes may be masked by other unrelated factors. In addition, the amino acid studies were qualitative in nature and conceivably a quantitative difference could be present. Finally, qualitative or quantitative differences could be absent, yet the sequence of amino acids in the plasma proteins could vary and result in significant changes.

Acknowledgment: The authors are grateful to Rita Paska for technical assistance.

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Advances in Psychiatric Teaching and Training Programs

WILLIAM L. HOLT, JR., M.D.

The changes in undergraduate teaching of psychiatry in the United States in the past decade can be described as chiefly an infiltration of psychiatric concepts into the clinical teaching programs of other departments, an abandonment of didactic lecture methods in favor of contact with patients in the clinic and general hospital wards, and an inclusion of scientists from other fields in the seminar type presentation of the relation of sociology, anthropology, biology and psychology to behavioral patterns engaging the present day psychiatrist in his work outside the institutions into which he had formerly withdrawn with the chronic locked-in patients society had grown to fear.

The growth of life (or behavioral) science departments in medical schools has largely been an outgrowth of the effort by psychiatry departments to broaden understanding by all physicians of emotion and motivation. Their importance to understanding the baseline of normal behavior and correcting disturbances of health and behavior must be grasped by the medical practitioner who would make therapy truly successful.

Many medical schools in the United States are establishing courses in the first and second years of medical education dealing with the biological, social and economic factors in health and disease. Concepts of behavioral science are often presented in the second year in conjunction with a course on patient interviewing. The relationship of these new courses with psychiatry is often close, as their success is of crucial importance for the growth of psychiatric understanding by the medical student. It is still considered important that there be an introduction to clinical psychiatry taught in the second year. This course is usually oriented about psychopathology and the mental examination. Most medical schools now present some case material to illustrate mental mechanisms and their value to the patient's self-esteem, and the social maladaptation of the resulting behavior change in a given cultural setting.

There continues to be a cleavage in orientation of the teachers of psychiatry as to whether recruitment into our specialty is better aided by teaching in clinics of general hospitals where neuroses and emotional reactions to physical disease are predominant. Some leading teachers still consider "major" psychiatric problems, abundant in the more isolated mental hospitals, as a challenge to the student and physician.

The increase in psychiatric beds in general and university teaching hospitals has served to bring more of the acute major psychiatric case material into ready accessibility of the student and teacher. In 1957 there were 195,359 discharges from the psychiatric facilities of general hospitals in the United States, a more than adequate amount of inpatient case material for the 7,000 medical school graduates of that year. Psychiatric out-patient clinics of general hospitals have grown rapidly and allow for a balanced instructional program in the "minor" behavioral disorders. Clinical clerkships average four weeks in each of the third and fourth years, the majority of medical schools using clinic material in the third year and in-patients in the fourth year programs. At Albany Medical College the fourth year student works in the out-patient department doing supervised psychotherapy, often with gratifying success that encourages him to treat minor psychiatric disorders himself in later years of practice.

Post graduate and graduate psychiatric training programs can be divided into two areas:

(1) Post graduate courses for non-psychiatrists, designed to aid them in handling minor personality problems seen in their primary field of practice, so that they more clearly understand what they can successfully do to help patients not sufficiently disturbed to require care by the psychiatrist.

*Read at a joint meeting of the Eastern Psychiatric Research Association (on World Tour) with the Kanto Neuropsychiatric Assn. and Japan Mental Hospital Assn., Tokyo, Japan, July 7 and 8, 1960.

(2) Courses for general practitioners, usually of a few weeks duration, are given in many postgraduate teaching centers. Albany Medical College has pioneered in two-way F-M radio teaching, including psychiatric topics in a series of broad medical scope. Staffs of 30 general hospitals in a radius of 120 miles meet at their own hospital which has a transmitter to allow questions to be immediately answered by the teaching group at Albany and three other medical schools. Sample topics discussed by the Albany Psychiatry Faculty have been "Management of Depression," "Proper Use of Tranquilizers and Energizers by the Family Doctor." Television has occasionally been employed for reaching an even wider audience.

The graduate training program for physicians wishing to become psychiatrists has shown considerable change in the past decade. The history of training programs in the specialty of psychiatry is of special interest to me as I have had the good fortune to receive training in four institutions that have participated as leaders in the important eras in the growth of American psychiatry: Massachusetts General Hospital, Worcester State Hospital, Boston Psychopathic Hospital, and the Albany Hospital.

The earliest program was one of direct preceptorship to the self-taught leaders whose altruism and initiative led to the establishment, often with the help of religious groups, of hospital facilities for the care of the mentally ill. In 1755 the Pennsylvania Hospital was built with a department for the medical treatment of mental illness but care was primitive and confined to cells in the cellar. At the suggestion of Benjamin Rush, the first eminent American psychiatrist, teacher and author of a textbook on Psychiatry, a separate building was erected in 1841, some 30 years after his request. Thereafter all mental patients were cared for at a separate location, a custom widely followed. The building of the insane division of the Massachusetts General Hospital was begun in 1811, the same year Benjamin Rush requested that the Pennsylvania Hospital build a better place than the damp cells.

Typical of the era of the building of State Hospitals for the Insane was Worcester State Hospital, opened in 1833. This institution had an enviable record of 80 per cent therapeutic success when its size was under 200 patients and a good activity program was carried out with moral persuasion rather than force and restraint, but over-crowding soon brought therapeutic futility. The university psychopathic hospital movement initiated for teaching and research, organized and successfully advanced by Griesinger in Germany in the last half of the 19th century, had slow spread in other countries. It gathered impetus in the United States early in the 20th century when neuropathological research achieved a triumph over the demonological concept of insanity with the staining of the spirochete of general paresis by Dr. Joseph Moore of Albany and its recognition by Noguchi who shared the Nobel Prize in medicine with his friend in 1913.

The movement for returning the care of mental patients to the General Hospital began in 1902 when Albany County built a wing for detention and treatment of mental patients at the Albany Hospital, the teaching hospital of Albany Medical College. This was at the suggestion of Dr. J. Montgomery Mosher who directed its activities as a teaching unit for the succeeding 20 years. Of this unit Albert Deutch in his book "The Mentally Ill in America" says "The first psychopathic ward in a general hospital in America fulfilling the function of actual therapeutic treatment besides detention and observation was established at the Albany Hospital in 1902." Psychopathic wards were soon in operation in several other university cities: Ann Arbor, Mich., in 1906; Boston Psychopathic Hospital in 1912; and the Henry Phipps Clinic in Baltimore in 1913. These were not integral parts of a general hospital but separate structures, and therefore were more isolated fom the needed everyday contact of medical students and teachers of other departments of the affiliated medical schools.

Interns of the Albany Hospital began serving an assignment in the psychiatric wards as early as 1907. Medical students got bedside teaching there in a 10-week course at

Abany Medical College as early as 1903, students in groups of 2 or 3 examining and presenting their case to the class each week. Psychiatric nursing courses were conducted from the beginning, and of these nurses Dr. Mosher said, "Aggressive manifestations (in patients) are usually based on fear, and nurses do a better job if they understand their patients. The apprehension of the patient must be removed and measures of relief applied with caution until confidence is established. Nursing is more vital than buildings or drugs."

Education of the doctor and nurse in psychiatric understanding does indeed need to proceed by parallel paths if not "hand in hand." The mental patient is improved by having his care given in a general hospital where young nurses flock to be near the young doctors in training and where there is the best teaching program. The general hospital is closer to the patient's home and family and job, making community rehabilitation easier and early treatment less difficult of acceptance by patient and family.

Continued contact with the patient's psychiatrist through the community clinic or private office is only feasible if the hospital care, when necessary, is given in the local or nearby community hospital, usually a general hospital. Training should therefore be organized to occur where patient and doctor can effect the best therapeutic contact, as close to the patient's home as his doctor.

There were 515 general hospitals in the United States having admissions for psychiatric patients in 1957. Most were in small units averaging 20 beds per unit. Albany Hospital with a 58-bed unit admitted 1,500 patients in that year, of which 85 per cent were discharged to their homes, after an average stay of nine days. Private office calls and out-patient clinic visits served to rehabilitate the majority who were thereby saved from prolonged disability and possible chronic custodial care at a state hospital remote (80 miles) from their homes.

The Albany program probably represents the extreme of shortest possible hospitalization for those requiring admission. Day care units are making an appearance in a few larger population centers and at the Boston Psychopathic represents a large segment of its total service to the community. I believe an out-patient clinic of a general hospital making available chemotherapy, occupational therapy, shock therapy, as well as psychotherapy, can closely approach the effectiveness of a day care center in making hospital admission unnecessary.

The establishment of an examining Board of Psychiatry and Neurology in 1934, under the auspices of the American Medical Association, American Psychiatric Association and American Neurological Association, has done much to standardize psychiatric graduate training programs in the United States. The number of diplomates approved by this Board was under 900 in 1940, but over 5,000 in 1955 when membership in the American Psychiatric Association had risen to 9,000. Men entering psychiatry are getting good training today and usually are able to pass the Board examinations.

Board-approved three-year training programs are offered in 204 hospitals with positions available for 3,185 trainees (residents or fellows) or about 1,000 new trainees each year. Some 87 hospitals offer 420 trainees training credit of one or two years toward the Board required three years. At least two years of training must be taken in the same training center. Of the 204 full three-year approved hospitals, some 73 are in non-federal general hospitals, usually in medical school teaching centers. Of all residencies, 78 per cent were filled. Some 526 approved residencies were held by graduates of foreign medical schools. Some 8 per cent of graduates of foreign medical schools taking residencies had approved residency training in psychiatry in 1958-59. These 526 physicians were not all foreign born, as a considerable number of United States citizens took their medical education abroad.

One may ask if many foreign physician applicants are rejected by psychiatric training centers in the United States. The proportion of such candidates rejected by approved residency programs is fairly large though the exact number is not known. As vacant training positions exist (700), ap-

plicants may wonder why. The answer is that a high level knowledge of conversational English is required for effective interviewing and talking therapy of psychiatric patients. This facility is often difficult to acquire, and a personal interview of the applicant is usually impossible to arrange. Applicants' claims and testimonial letters of recommendation have often led to mutual disappointment. These cultural barriers are an additional handicap in the interpersonal relationship. A study of our culture is rarely taught in the foreign medical schools.

The American Medical Association has recently established an overseas examination system which it is hoped will assure properly qualified applicants of acceptance as the examination includes spoken English as well as basic medical knowledge. Until would-be residents overseas know what is required to be successful in a psychiatric training program in the United States, a considerable number will fail the examination. In March 1960 55.5 per cent of 6029 applicants were certified. It is usually the more capable, ambitious and adventurous student who will overcome the handicap of training in a foreign tongue. When adequately prepared in English such men usually perform outstandingly. The Educational Council for Foreign Medical Graduates, established in 1957, will doubtless improve the average medical qualifications of those accepted for training from abroad. Knowledge of our history and culture is as important as our language and is not yet tested; 30 psychiatric teaching centers are still hesitant and many require interviews. The newer advances in American psychiatry are being added to the training programs as fast as qualified teachers are trained in these aspects of psychiatry. The proportion of new diplomates entering private practice is very high at present. Training in psychotherapy is therefore increasingly stressed.

Psychoanalytic training institutes have had a growth that has increased the proportion of analysts to other psychiatrists from 2.5 per cent in 1925 to 6.6 per cent in 1955. Analysts have been added to the teaching staffs of most university training centers so their influence in teaching programs is considerable. The importance of training in the emotional and habit disorders of childhood as preventive psychiatry is increasingly recognized. A sub-specialty qualifying board in child psychiatry has been established.

Group therapy has become a body of knowledge allowing organized training under supervision. It appears of great value in adolescence and with delinquents. Albany Hospital Psychiatric Clinic has found that group therapy training methods can be structured to serve many patients with effectiveness. Residents receive training in this modality throughout their second and third years. Flexibility has been allowed within the approved program so that those more interested in community clinic work may get experience in more than one clinic setting whereas those desiring it may have work in insulin coma units of affiliated institutions. Special courses are provided in neuroanatomy, neuropathology, electroencephalography and hypnotherapy.

All students receive the basic in-patient experience in an acute treatment unit, a few months on a chronic service, three months on neurology, part-time child guidance and adult psychotherapy of ambulatory out-patient cases. These have become almost universal in training programs. A thorough grounding in pharmacological therapy and shock therapy is given in the first year and an abundance of case material allows for sharpening of diagnostic skill and quick mobilization of all effective treatment modalities. Seminars with a psychoanalyst cover theory and therapy. This prepares the young psychiatrist to serve many more patients than would other types of therapeutic and training centers. Our goal at Albany is like that of the community oriented clinics now springing up in every county of this State —speedy relief of psychiatric disability by the most effective and economical means consistent with the patient's and family's needs.

Electric and Chemical Convulsive Therapy in Psychiatry

(SCC Modified EST, Metrazol and Indoklon Convulsive Therapy)

DAVID IMPASTATO, M.D.

This paper discusses the following:

EST vs. Drug therapy in depressions.
"Large dose" vs. "small dose" SCC modification of EST.
Description of PM-GM technics.
Metrazol and Indoklon Convulsive therapy.

Former indications for convulsive therapy (C.T.) have not been substantially altered by recent experience, and C.T. is still the most effective and reliable modality for the treatment of acute psychoses, especially depressions.

The practical elimination of fractures by using succinylcholine, and oxygenation of the patient have made electroshock therapy (EST) the safest treatment in psychiatry, not excluding psychotherapy. Yet, despite the therapeutic superiority and safety of EST, there has recently been a definite shift from EST to imipramine and the hydrazide monoamineoxidase inhibitors for the treatment of depressions.

What is causing this shift from a proved therapeutic method with a high degree of safety and success, to the more dangerous and less successful experimental drugs? Among other causes for this shift, are factors which lead to a negative attitude toward C.T. by patients and relatives as well as psychiatrists and the thorny question of anxiety in C.T.

TABLE I

Factors Leading to a Negative Attitude of the Patient and Relatives Toward EST

1. Fear of electricity in general, and the association of the word "shock" with a severe, painful jolt in the head which may result in death.
2. Misinformation regarding complications gathered from various sources including psychiatrists and especially non-medical psychotherapists.
3. Fear of EST as an expression of the patient's negativism or antagonism to any therapeutic procedure.
4. Fear of EST as an expression of fear of being put to sleep.
5. Pan-anxiety spreading to include EST.
6. Contagion anxiety.
7. Insecurity of the psychiatrist in administering the treatment.
8. Improper management of the patient by the psychiatrist or his associates.

Read at a Joint Meeting of the Eastern Psychiatric Research Ass'n with Kanto Neuropsychiatric Ass'n and Japan Mental Hospital Ass'n July 7 and 8, 1960, at Tokyo, Japan.

TABLE II

Possible Operative Factors Which Make Us Offer the Patient Drug Treatment Instead of EST

1. Procedure is not esthetic.
2. Feelings of inadequacy regarding injections, administration of oxygen, the placing of an airway, etc.
3. Fear of supposed complications.
4. Forgetting or disregarding the value of the convulsive treatment.
5. Inertia and lethargy and dislike to do something active.
6. Fear of a law suit.

Table III shows the therapeutic superiority and greater safety of EST compared with psychotropic drugs.

TABLE III

EST vs. Drug Therapy: Results, Complications and Duration of Treatment

	EST	*Drug Therapy*
Remission	70-90%	50-70%
Duration of Treatment	3-4 weeks	4-8 weeks
Duration of Follow-up Treatment	0	Up to years
Relapses	0	Quickly when drug is stopped
Total Visits	7-12	30+
Total Cost	Less	More
Memory Changes	Yes	No
Liver Damage	No	Yes
Blood Dyscrasia	No	Yes
Hypotension with Falls and Fractures	No	Yes
Deaths as Result of Treatment	Yes	Yes
Suicides	No	Yes

Fig. 1 shows the dramatic increase of the incidence of suicide when drugs were substi-

RELATION BETWEEN SUICIDE AND THERAPY IN A LARGE STATE HOSPITAL

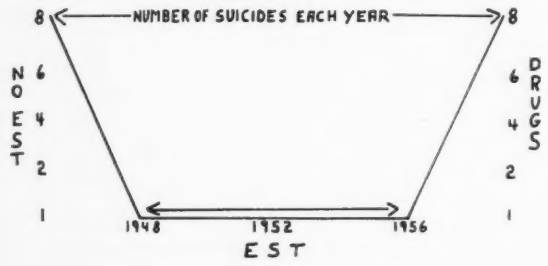


Figure 1.

tuted for EST in a large New York state hospital.

Anxiety and fear are common problems in EST. In most instances they arise from the inability of the physician either to prevent or control them. Table IV shows some of the main causes of anxiety and fear.

TABLE IV

Reasons for Treatment Anxiety

1. Inability of psychiatrist to properly condition patient.
2. Re-enforcing patient's anxiety by playing up to his whims.
3. Too benevolent an attitude towards patient's fears.
4. Too harsh an attitude towards patient's fears.
5. Failure to make patient understand that certain sensations during treatment are expected and normal.
6. Changing the treatment procedure.
7. Failure to realize the anxiety in the patient and protect him from relatives who play up to patient's anxiety.
8. Failure of psychiatrist to hide any insecurity feelings he may have regarding the treatment.
9. Failure of psychiatrist to properly train his staff.
10. Failure in technic.
11. Failure of psychiatrist to identify pseudo-memories.

Succinylcholine (SCC) in EST

The majority of psychiatrists are in accord regarding the routine use of SCC in EST, except for two questions in which there is difference of opinion.

The first is: "What is the proper dose of SCC?" Here there are two distinct schools of thought. One advocates relatively large doses—40 to 100 mg.; the other, small doses —5 to 20 mg. Psychiatrists using large doses, in the main, employ anesthetists, those using small doses usually administer the drug themselves. Advocates of large doses anesthetize the patient prior to administration of SCC and oxygenate the patient pre and post EST. They reason that it is impractical to use SCC without anesthesia as administration of the SCC alone is accompanied by a feeling of suffocation which is so fear producing that it is unusually difficult to persuade a patient to undergo another treatment. They claim that the large doses of SCC are necessary in order to obtain "complete relaxation." They acknowledge that by using large doses of SCC their patients often have periods of apnea lasting five to ten minutes, but this does not alarm them, as they feel confident in their ability to keep the patient properly oxygenated till he recovers. They convey the feeling that it does not matter if a patient resumes breathing in three minutes or 30 minutes.

The advocates of small doses are anxious to see their patients recover as soon as possible. They feel that in C.T. SCC is used only to avoid fractures, and that the relaxation produced with a small dose of SCC has achieved this end. They are convinced that "full relaxation" is unnecessary for the purpose of avoiding fractures. They are, therefore, happy to continue to use small doses of SCC. They do not use pre-SCC barbiturate anesthesia because they can successfully manage the feeling of suffocation without barbiturates. This they do either by administering the GM as soon as they notice the first SCC fasciculations or by giving a double petit mal prior to the GM (see below). They are very happy that their technics are successful; that their patients take the treatment well; suffer little or no apnea; in the main do not require oxygen, do not develop anxiety or fear; and best of all, are free from fractures.

The high dose technic seems irrational as it attempts to obtain a result with more drugs, in larger doses, which can and is being accomplished daily by fewer drugs in smaller doses. The high dose technic is dangerous as it subjects the patient to the hazard of paralysis of the respiratory center,

TABLE V

Relative Merits of "Large Dose" and "Small Dose" SCC Technics

	Large Dose	*Small Dose*
SCC	20-1000 mg.	5-20 mg.
Anesthesia	Always	Occasionally
Pre-oxygenation	Always	Occasionally
Post-oxygenation	Always	Occasionally
Prolonged Apnea	Frequent	Rare
Time EST After SCC	45-60 sec.	10-20 sec.
Fractures	0	0
Use of Anesthetist	Often	Rarely
Intravenous Drip	Often	Never
Electric Anesthesia	Never	Often
Danger of Death from Respiratory Paralysis	Moderate	Little
Recovery	7-12 min. or longer	3-4 min.
Feeling of Suffocation	If USAB inadequate	Only if technic wrong
Anxiety	Rare	Rare
Relaxation	3-4+	2-4+
Valsalva Phenomenon	0	0

Figure 6.

first by the barbiturate, and then by the SCC. Most of the users of high doses of SCC seem to ignore the fact that SCC has a central depressing action on the respiratory center of some patients; and that patients with low cholinesterace titers either acquired or inherited, are unduly sensitive to minute doses of SCC. In addition, the barbiturate may depress the bundle of His and cause cardiac arrest. Why submit the patient to these added risks when they can be by-passed?

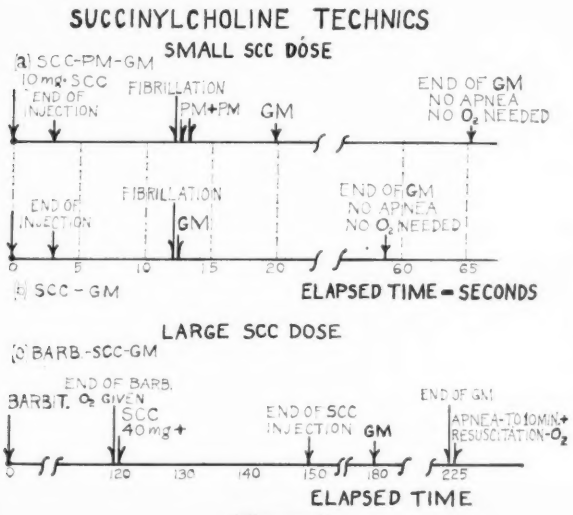


Figure 2.

The second question is, "When should the GM be given following the injection of SCC?" First let us briefly review the technics of SCC modified EST.

A. Large Dose Technic:

The patient is anesthetized with an ultra short acting barbiturate. This is followed by 40-80 mg. of SCC over a period of 30 to 60 seconds. The GM stimulus is given 45 to 60 seconds after the SCC injection (see Fig. 2c).

B. Small Dose Technics:

1. PM-GM

The patient is given I.V. 5 to 15 mg. of SCC quickly (within 3 to 5 seconds) and he is asked to close his eyes. Eight to 12 seconds later, when fibrillations are seen over the patient's chin (or when the patient signals by a grunt or cry), a double petit mal, one to two seconds apart, with settings of 1/10th second 100 volts is given, and this is followed five to 10 seconds later with the grand mal (Fig. 2a).

The double petit mal effectively blots out memory and causes complete amnesia for the entire procedure. The only thing the patient remembers is being stuck with the needle at the beginning of the injection of SCC. When applied correctly, the double petit mal acts as an electric anesthesia, and is superior to barbiturate anesthesia.

2. GM

The patient is given I.V. 5-15 mg. of SCC quickly within 3-5 seconds. When fibrillations are seen, the grand mal is given (see Fig. 2b).

The high dosers argue that the maximal effect of SCC does not occur in less than 45 to 60 seconds after its injection, and insist on waiting this interim before giving the GM stimulation.

The low dosers say that when a small dose of SCC is given quickly, it becomes effective in less than 20 seconds.

With colleagues at Kings Park State Hospital I performed the following experiments involving SCC.

a) To 20 patients we gave GM's on successive treatment days. On the first treat-

ment the GM was given 10 seconds after the beginning of SCC fasciculation. On the second, 20 seconds, the third 30, and so on to 60 seconds. Following each GM we estimated the degree of muscular relaxation.

b) To 20 patients we gave GM's on successive treatment days, but gave a double petit mal stimulation at the beginning of the SCC fasciculation and followed this with a GM stimulation at varying intervals. At the first treatment the GM was given 5 seconds after the double PM; on the second treatment, 10 seconds later, and so on with 5 second increments with each succeeding treatment up to 90 seconds. Following each GM we estimated the degree of muscular relaxation. The following are the findings:

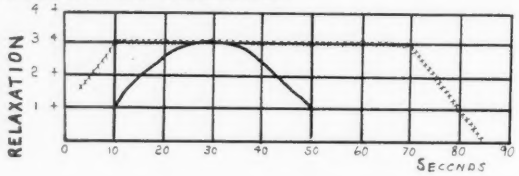
a) As shown in Fig. 3, the GM technic produces sufficient muscle relaxation to prevent fractures starting with the GM given 20 seconds after fasciculation and lasting up to the GM given 40 seconds after fasciculations. This interim of 20 seconds we term the "adequate relaxation interim." GM's given during this interim will be of sufficient softness to prevent fractures. GM's given outside this interim, either before 20 seconds or after 40 seconds from the beginning of SCC fasciculation, are not sufficiently softened and may give rise to fractures.

b) With the double petit mal technic adequate relaxation began with the GM given at 10 seconds and lasted up to the GM given at 70 seconds. The interim therefore is of 60 second duration.

These findings indicate that following I.V. SCC, the proper time to administer the GM stimulation varies with the technic used and is 20 to 40 seconds with G.M., and 10-70 seconds with the PM-GM technics.

The double petit mal, re-enforces and increases the duration of SCC. This is the reason less SCC is needed to produce a given degree of softening when petit mals are used. The mechanism of the enhancement of the action of SCC by petit mal is unknown. A possible explanation might be that the PM releases acetylcholine (AC) increasing the depolarization effect of the SCC, which in fact consists of two molecules of AC.

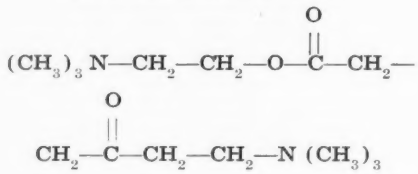
RELAXATION RESPONSES WITH GM APPLIED AT VARIOUS INTERVALS FOLLOWING SCC PERIORAL FASCICULATION IN STANDARD AND PM-GM TECHNICS



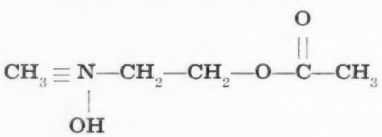
xxxxxxx PM-GM
——— Standard

Figure 3.

SUCCINYLCHOLINE



ACETYLCHOLINE



Pentylenetetrazol (Metrazol) Convulsive Therapy

Although metrazol convulsive therapy (MCT) was introduced several years before (ECT), very little mention of this form of therapy is made in recent textbooks on psychiatry. As a matter of fact, the best description of MCT is found in the first book on "shock therapy" published in America in 1941 by Jessner and Ryan. MCT was popular for about two years, from 1936 to 1938, following which its use declined rapidly. The decline was due to the introduction of ECT.

The indications and contraindications for MCT are the same as for EST with the addition that MCT is indicated for patients who do not respond to EST. In fact, it has been for the reason of this use that MCT has not been completely displaced by EST. Recently, renewed interest has been shown for this form of treatment.

The preparation of the patient is exactly the same as for EST.

Technic:

The patient is first injected, intravenously, with atropine sulfate 1 mg. (1/60 grain). This is immediately followed by 8-10 cc. of metrazol solution, given as quickly as possible, through a moderate gauge (22) needle. Within 10-15 seconds jerky fasciculations appear in the limbs and face. These last 10 to 15 seconds and then there occurs widening of the palpebral fissure, opening of the mouth, and the epileptic cry. These are followed by the tonic and clonic phases of the convulsion. The metrazol convulsion seizure therefore has three distinct phases: the build-up phase or the fasciculation phase, the tonic and the clonic phases. The fit lasts about 60 seconds which is about 15 seconds longer than that produced with the electric current. With this technic the convulsions are severe and fractures are frequent, and in addition, the patient develops considerable fear of the treatment. To overcome these difficulties the patient is first put to sleep with thiopental intravenously (electric anesthesia by using a double petit mal can also be employed), then he is given 20 mg. or more of SCC intravenously. This is followed by the injection of 15 cc. or more of metrazol. The higher dose of metrazol is needed to neutralize the anti-convulsant action of thiopental. The fit is now greatly modified; the convulsion is feeble and unlikely to produce fractures; and the patient does not develop fear of the treatment as the thiopental, or double petit mal produces complete amnesia. With these modifications of the technic it is now possible to give MCT as freely as EST. EST suppresses respiration which may prove to be a problem. Metrazol stimulates respiration and thus has this advantage over EST.

The clinical results are the same in both EST and MCT although they are claimed by some to be better with MCT. There is also a claim by some that the result with MCT is more enduring.

The complications in MCT are the same as those found in EST except that thromboses are more frequent. Occasionally, atypical seizure from insufficient metrazol is obtained. They may consist of acute agitation, marked anxiety, or confused states of disorientation. When these reactions occur it is wise to induce a grand mal reaction by using the electric current. Therefore, when MCT is given an electric convulsive machine should always be at hand.

Hexafluorodiethyl Ether (Indoklon)

At the present time a new therapeutic convulsant is being investigated. It is a volatile fluid, administered by inhalation through a specially constructed mask. The convulsions produced are violent and if unmodified by SCC often give rise to fractures. The Kings Park State Hospital group introduced the SCC modification of Indoklon convulsions. With this modification fractures have not occurred. The Indoklon may be preceded by barbiturates or electric (double P.M.) anesthesia.

When SCC is used, the muscles of respiration become paralyzed and the Indoklon has to be forced into the lungs. This is accomplished by a special mask connected to a large diameter metal tube within which is a glass container holding a wick soaked with Indoklon. The other end of the tube is connected to an ordinary breathing bag connected through a rubber tube to an oxygen tank. To administer the Indoklon the bag is filled with O_2 and the O_2 tank is shut off. The bag is now squeezed once every 4-5 seconds. The O_2 squeezed out of the bag passes over the Indoklon saturated wick picking up its vapor and transmitting it to the lungs. The convulsion occurs within 6-10 squeezes.

More recently we have given Indoklon intravenously in a 5% solution dissolved in ethylene glychol (carbowax 300) alcohol and water. This mixture forms a thick solution. It may be given, like the inhalant form, with or without anesthesia.

ETHER

$H_3C—H_2C—O—CH_2—CH_3$

HEXAFLUORODIETHYLETHER
(INDOKLON)

$F_3C—H_2C—O—CH_2—CF_3$

Figure 9.

The following are the technics of administration of Indoklon:

TABLE VI

Inhalation—Hexafluorodiethyl Ether (Indoklon)

(May be given with or without anesthesia.)

Technic:

1. Fill breathing bag with O_2.
1a. I.V. atropine 1 mg. (1/60 grain).
2. I.V. Thiopental (optional).
3. Succinylcholine I.V. immediately after Step 2.
4. Double petit mal 5 seconds following step 3, if step 1 was omitted and anesthesia desired.
5. Mask to face.
6. Squeeze breathing bag 12-15 times per minute.
7. Remove mask when myoclonic twitches are seen (20-30 seconds).
(Within 10 seconds patient enters tonic phase.)

TABLE VII

Intravenous Hexafluorodiethyl Ether (Indoklon) Technic

(May be given with or without anesthesia)

1. I.V. atropine 1 mg. (1/60 grain).
1a. Anesthetize patient with I.V. thiopental (optional).
2. Give succinylcholine I.V.
3. Five seconds after step 2, give double petit mal (optional) if step 1 was omitted and anesthesia desired.
4. Administer Indoklon I.V. at rate of 1 cc. every 4 seconds. Within 10-15 seconds after step 4 myoclonic twitching occurs. Tonic phase follows a few seconds later.

The Indoklon seizure, like the metrazol seizure has three phases. A preliminary myoclonic phase followed by the tonic and clonic phases. The convulsion is longer than the EST fit, usually lasting 60-90 seconds.

The indications of Indoklon are the same as for EST. We have produced some 500 Indoklon convulsions without complications, except for multiple convulsions with the inhalant method, and occasional venous thrombosis with the intravenous method. The clinical results parallel those of EST. As yet, no definite special indication for Indoklon has been found. It may help in chronic schizophrenia.

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Monoamine Oxidase Inhibitor Therapy in Adolescent Psychiatry

ROBERT A. SOBLEN, M.D., and JOHN C. SAUNDERS, M.D.

History demonstrates that medicine often follows illogical but understandable patterns. The concept of childhood schizophrenia probably started with the publications of Sante De Sanctis in 1905. He pointed to acute or chronic toxic diseases, genetic, and developmental anomalies as the principal etiological factors. At that time there was a reluctance to accept a diagnosis of childhood schizophrenia. This has not completely disappeared because childhood schizophrenia cannot be characterized as a separate and distinct disease entity. The problem of heterogeneous etiology remains but the primary symptoms, desire for a solitary existance and an obsessive desire for the continuation of sameness may be pathognomonic. Studies to justify an eclectic theory have shown wide variations in the etiological determinations. Some are probably organic and others are possibly psychological initially. Related and overlapping symptoms will arise depending

From Rockland State Hospital, Orangeburg, N. Y.

The phenelzine used in this study was supplied as Nardil by the Warner-Chilcott Laboratories, Morris Plains, N. J.

The PIH used in this study was supplied as Catron by the Lakeside Laboratories, Inc., Milwaukee, Wisc.

on the degree of the child's maturation. Rather than remaining pure symptoms they interact with time into the frequently observed complex syndromes.

Medical advances in the care of children have been restricted largely to the prevention of infectious diseases although some progress has been made in managing genetic anomalies. With the appearance of psychopharmacological agents, it was observed that tranquilizers (reserpine and phenothiazines) may produce favorable results in alleviating aggressiveness, impulsiveness and disorganization in children (usually schizophrenic) allowing many of them to integrate their expected mental and physical growth patterns. These tranquilizers, however, often failed to help the children with primary behavior disorders.

The amphetamines were found to be useful primarily in short term amelioration of symptoms in the so-called neurotic behavior disorders. Bradley[1] reports that they stimulate quiet withdrawn children and calm hyperactive aggressive ones. Increased urinary excretion of norepinephrine was found in aggressive-hostile adults and increased excretion of epinephrine in passive-fearful ones.[2] Do the amphetamines tend to return the dynamic equilibrium between norepinephrine-epinephrine to its physiological ratio? The resulting elation from the amphetamines allows the adolescent to temporarily obtain security and confidence, whether the behavior disorder be diagnosed as psychogenic or organic. This again emphasizes the lack of understanding about the etiological processes in children or adults in psychiatric diseases.

Therapeutic efficacy with monoamine oxidase inhibitors was demonstrated in a group of childhood (infantile autistic) schizophrenics.[3, 4] This therapy was observed to improve interpersonal relationships, reduce withdrawal tendencies and alleviate muteness in varying degrees in these autistic children. The monoamine oxidase inhibitors alleviated depression, withdrawal, apathy and flattened affect in adults and it was reasoned that they should be effective in adolescents with the same symptoms.

Our problem was to relieve anxiety expressed by apathy, low motor activity and withdrawal in hospitalized male adolescents ranging between 12 and 16 years of age. The diagnostic classification in psychiatry does not allow the desired discrimination described in many publications. In adolescent psychiatry, this differentiation is even greater because of the complex interaction psychological and physiological factors at different levels of maturity. The primary symptom in many adolescent disorders is anxiety but it is frequently evidenced by other symptoms. This prevents the integration of the child, disrupting his psychic and biologic developmental processes. When these symptoms persist, the child becomes more disintegrated and the rate of failures increases. This behavior pattern is soon established resulting in conflict in all areas of his life.

Subjects:

A group of 20 male adolescents between the ages of 12 and 16 were selected. Four were diagnosed as childhood schizophrenics and 16 primary behavior disorders. This group was not able to function in the regular treatment program carried on in one of our buildings. They could not maintain the standard of their associates in performance at the academic, vocational, recreational, social, self-governmental activities or in the therapeutic program. Psychological testing indicated that they were below the average in academic work although at the average for vocational performance. However, instead of performing at an average level, their activities dropped far below average. In the classroom their span of attention was too short for serious learning. These adolescents, in general, could not function in their environment in a manner acceptable to themselves and to others. They had failed to respond favorably to phenothiazines or routine hospital milieu.

Dosage Regimen

Two groups of 10 patients each were selected for study according to presenting symptoms and diagnosis. They did not know

the type of medication and suspected they were receiving another type of tranquilizer (they were allowed to believe this). Previously the tranquilizers had increased their problem of being unable to function at the same level of activity as their associates. They were given either phenelzine (Nardil) 15 mg. b.i.d. (range of 15 to 45 mg. daily) or PIH (Catron) 6 mg. b.i.d. (range of 6 to 18 mg. daily) for a period of three and a half months.

Results

The evaluation of all forms of psychiatric therapy remains largely subjective. We have recently demonstrated that the interaction chronograph interview technique in adults will provide statistically significant objective data for psychopharmacologic evaluation and current studies are under way in children with monoamine oxidase inhibitors.[5, 6] Placebo therapy at best can produce transient alleviation of symptoms at the 35 per cent level.[7] Eisenberg reports that teachers' observations are reliable since the classroom provides a standard background of academic and social expectation against which the child's behavior can be evaluated.[8] Recently, Letemendia and Harris[9] made a highly informative observation on the value of placebos, "If further experiments confirm the present findings it may be necessary to consider whether the double blind procedure is not a self defeating one. The final assessment of patients was not affected, despite the inefficacy of the double blind precaution". We evaluated the children in academic, vocational, recreational, social, family, group therapy and hospital staff activities and relationships.

Although academic achievement remained poor there was an increase in concentration time and they were more alert, attentive and cooperative. The major area of improvement was indicated in their vocational performances. They became more competitive and expressed desire to impress others with their accomplishments. They were reported by their instructors to have improved in interest, concentration and speed in learning to work with tools and their performance improved as indicated by their output and quality of product.

Previous to monoamine oxidase inhibitor therapy, these patients showed little interest in sports. They were poorly coordinated and clumsy and the other patients did not wish to have them on their team. After therapy they showed improvement and became acceptable members of the team. Their social activities had been largely asocial and frequently anti-social. With therapy they would attend the dances. However, even though they danced they remained afraid of the girls.

Impairment of family relationships was a frequent factor in the hospitalization of this group. After commencement of therapy the home visits were generally more satisfactory. This observation is based upon parents' judgment which is considered of significant value.[10] In group therapy sessions they demonstrated ability to handle constructive criticism. They participated now in the meetings and expressed their thoughts and emotions. Their previous reluctance to answer questions or stand on their feet was diminished during therapy. Previously they would withdraw or give only "yes" or "no" answers. Those who improved sufficiently for discharge had also been elected to one of the self-governing committees. Formerly there had been considerable resistance to staff decisions. These drugs modified the patients' behavior and cooperation with the staff was improved.

The relief of anxiety, withdrawal and low motor activity permitted integration of factors, known or surmised, essential for contact with reality and the mental and physical growth required for maturity. We were able to discharge 12 patients as a result of the monoamine oxidase inhibitor therapy. They were observed from four to six weeks after therapy was discontinued prior to discharge. After three months none of this group had been returned. There was improvement in 15 of the 20 with four showing little or no change and one becoming worse. Two of this group previously had attempted suicide and a total of 13 had been withdrawn or depressed.

Earlier tranquilizer therapy had failed to modify their behavior in a favorable manner. In fact the boys had frequently complained that it had made them feel worse by reducing their already limited activities. The regular hospital milieu resulted in only slight changes in their behavior patterns. Phenelzine and PIH were capable of alleviating their withdrawal, depression, apathy, flattened affect, passive attitude, and frequent hypomotoricity which we interpreted as a defense against their anxiety. Therapy with the monoamine oxidase inhibitors results in the individual patient becoming more acceptable to others and his environment to him. Once this state is attained he can integrate the processes for maturation required by all children in order to reach maturity.

Side Effects

Many side effects with monoamine oxidase inhibitors reported in adults were not observed in this group of adolescent children.

TABLE I

Results with Phenelzine Therapy (Nardil)

Pt.	*Diagnosis*	*Dominant Symptoms*	*Dosage*	*Side Effects*	*Results*
1	PBD—N	1,2,3,6,12,18	15-45 mg.	——	Discharged
2	PBD—C	1,3,12,18	15-30 mg.	——	Discharged
3	PBD—C	1,3,4,17	15-45 mg.	——	Discharged
4	PBD—N	1,3,4,5,12,17	15-45 mg.	Drowsiness	Discharged
5	Schiz.-Childhood	3,7,9,11,18	15-45 mg.	Transient rise in alkaline phosphatase	Discharged
6	Schiz.-Childhood	3,4,5,8,9,12,13	15-45 mg.	Emotional outburst	Discharged
7	PBD—C	1,3,4,15,17,18	15-45 mg.	——	Improved
8	PBD—N	1,3,4,17	15-45 mg.	——	Improved
9	PBD—C	3,4,15,17,18	15-45 mg.	Poor appetite	No Change
10	PBD—C	1,3,4,5,10,14,15	15-45 mg.	——	No Change

TABLE II

Results with PIH Therapy (Catron)

Pt.	*Diagnosis*	*Dominant Symptoms*	*Dosage*	*Side Effects*	*Results*
1	PBD—C	3,5,12,17	6-18 mg.	Drowsiness	Discharged
2	PBD—C	1,4,5,12,14,18	6-12 mg.	——	Discharged
3	PBD—N	3,5,15,17	6-18 mg.	——	Discharged
4	PBD—C	1,4,13,16	6-18 mg.	——	Discharged
5	PBD—C	1,5,12,18	6-18 mg.	——	Discharged
6	PBD—C	4,5,11,18	6-12 mg.	——	Discharged
7	Schiz.-Childhood	1,2,5,7,9,11,12	6-12 mg.	——	Improved
8	Schiz.-Childhood	1,3,7,9,11,18	12-18 mg.	Transient rise in alkaline phosphatase	No Change
9	PBD—C	3,13,16	6-18 mg.	Agitated, hostile and eloped	Worse
10	PBD—N	1,3,4,5,12,18	6-18 mg.	Transient rise in alkaline phosphatase	No Change

Interpretation of Diagnosis

PBD—N—Primary Behavior Disorder—Neurotic
PBD—C—Primary Behavior Disorder—Conduct

Symptoms

1. Anxiety
2. Aggressiveness
3. Apathetic
4. Conflict
5. Depression
6. Enuresis
7. Hallucinations — auditory
8. Hostility
9. Lack of contact with reality
10. Lying
11. Poor attention span
12. Poor family relationships
13. Sexual drives—aberrant
14. Sibling rivalry
15. Stealing and property destruction
16. Suicidal tendency
17. Truancy
18. Withdrawal

There was a significant reduction in the need for sleep in five patients and along with this was the paradoxical observation of sleepiness in three patients until the dose was reduced. One boy became boisterous and sarcastic and demanded to be released. When this was not granted he escaped. It was felt that some of the agitation was due to the medication. In a regressed schizophrenic, hyperirritability was observed if he was disturbed during his activities. It is essential that dosage be regulated in order to obtain optimum therapeutic efficacy. Three patients had a rise in alkaline phosphatase during the second month but this returned to the base line. No other biochemical indices changed significantly during therapy with phenelzine and PIH.

Contraindications

We have found no absolute contraindications, except a viral infection, for administration of monoamine oxidase inhibitors during three and a half years of clinical studies. However the drugs must be used with caution in the following conditions: with history of hepatic pathology in renal failure, in epilepsy and in topical application of cocaine since the occurrence of convulsive seizures is likely. The hydrazide oxidase inhibitors are members of a group of known compounds that act as prolonging agents. Therefore, if given in combination with another drug they may augment its pharmacological action.

The treatment of sucidal patients requires constant supervision until recovery is complete. A transitory period occurs where there is superficial improvement in the form of increased vitality but the patient remains unable to accept reality. This is the reaction comparable to that observed in patients, who after some improvement on ECT, attempt suicide.

Conclusions

1. Phenelzine and PIH are therapeutically effective in alleviating the symptoms of apathy, withdrawal, low motor activity, flattened affect and indifference in adolescent primary behavior disorders. The drugs resulted in the discharge of two of the four autistic schizophrenic adolescents as they became free of their hallucinations and returned to reality.

2. Freedom and/or reduction of the many signs and symptoms by phenelzine and PIH in this adolescent group enabled them to engage in the ordinary activities of adolescents essential for mental and physical development. Previously the tranquilizers (reserpine and phenothiazines) had been demonstrated effective in the control of aggressive behavior. Anxiety frequently appears to be expressed as aggression or withdrawal in the child or adolescent. Since either manifestation will prevent maturation, it is essential that psychopharmacological therapy be tried.

3. The amine oxidase inhibitors, phenelzine and PIH were found to be free of toxicity given under the conditions described in this report.

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A Biochemical Theory of Mental Illness

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The integrity of certain aldehydic substances is essential to psychic well-being. Serotonin, epinephrine, gamma-aminobutyric acid and choline, regulators of cerebral activity and chemical mediators or nerve transmission, are metabolized to organic acids (5-hydroxyindoleacetic acid, 3-methoxy 4-hydroxy mandelic acid, succinic acid and betaine respectively) after the formation of corresponding aldehydes in each instance.

Pyridoxal, an aldehyde that is excreted as 4-pyridoxic acid, is required for the synthesis of serotonin from 5-hydroxytryptophan and of gamma-aminobutyric acid from glutamic acid because both decarboxylases are pyridoxal dependent enzymes. It is also required for the conversion of tryptophan to nicotinic acid. This may be of importance to the central nervous system because the nicotinyl ring does not readily pass the blood-brain barrier. Any shortage of pyridine nucleotide would favor the activity of oxidases over dehydrogenases. Unlike dehydrogenases which utilize intermediary electron transport systems, oxidases transfer hydrogen directly to oxygen so that no high energy phosphate bonds are created for gradual release in support of brain cell metabolism.

Aldosterone, important in maintaining resistance to stress and the most potent steroid for preserving the life of the adrenalectomized animal, has an aldehyde group attached to the thirteenth carbon of its aromatic nucleus.

The formyl radical is essential for the activity of the folic acid coenzymes in the chemistry of phospholipids (synthesis of choline; conversion of homocysteine to methionine and glycine to serine), nucleic acids (synthesis of nitrogenous bases), pyridine derivatives (N'-methylation) and imidazole ring compounds (formimino group transfer).

Aldehyde oxidizing enzymes (dehydrogenases and oxidases) are group specific for aldehydic substrates.[1,2] Increased activity of these enzymes would be reflected by psychic aberrations consequent to the increased catabolism of aldehydic substances discussed above.

The Hypothesis

It is proposed that the production of aldehydic intermediates in the brain on an alternate pathway for the oxidative decarboxylation reactions (pyruvic to acetic acid and alpha-ketoglutaric to succinic acid) of the Krebs Cycle provides an organic basis for endogenous psychopathies. In oxidizing the aldehydic intermediates being formed in quantity (at two points on the final common pathway), the activity of undiscerning (group specific) aldehyde oxidizing enzymes becomes augmented through the mechanism of substrate induction.

The Alternate Pathway (Fig. 1)

In contrast with the known series of reactions, in which the oxidation and decarboxylation steps are unseparated (Reaction 1), in the alternate scheme a thiamine acetaldehyde complex is formed by straight decarboxylation of pyruvic acid (Reaction 1A). This is followed by exothermic dehydrogenation of the enzyme acetaldehyde complex to the enzyme acetate complex (Reaction 3A) with the generation of a high energy sulfur bond.

In a report[3] of nonenzymatic decarboxylation of pyruvate in vitro, an acetaldehyde thiamine complex formed which could not be broken down to yield free acetaldehyde. This great stability might be accounted for by the similarity of thiamine to ammonia derivatives that are carbonyl group reagents (e.g. hydroxylamine): the complex is in equilibrium with an unsaturated condensation product

$$CH_3CHOHNH \cdot TPP \longleftrightarrow CH_3CH = N \cdot TPP + HOH.$$

The acyloin condensation of acetaldehyde to acetoin

$$2(CH_3CHO) \longleftrightarrow CH_3CHOHCOCH_3$$

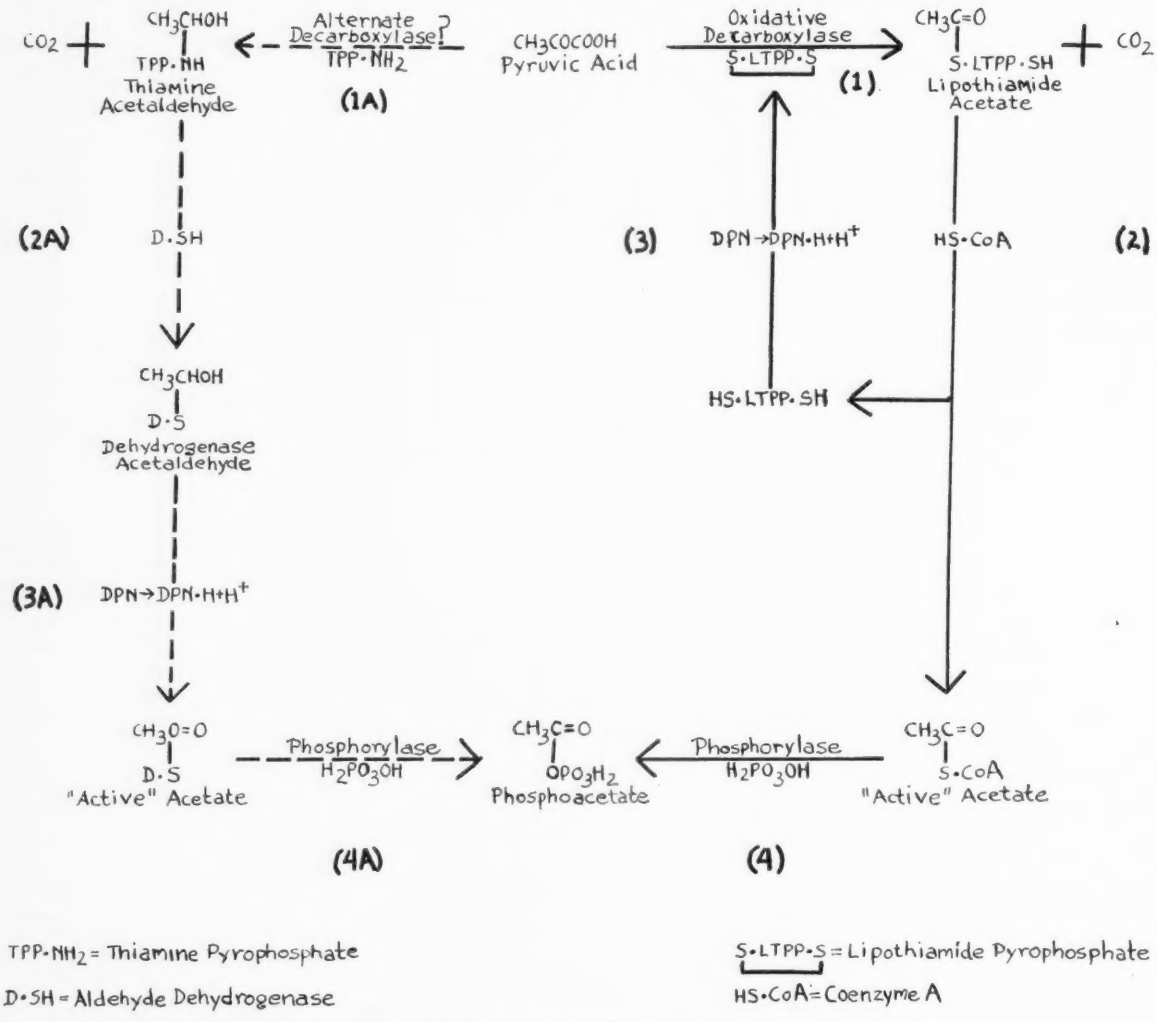

Fig. 1. The proposed alternate pathway and theknown pathway for oxidative decarboxylation of pyruvic acid.

is catalyzed in vivo by carboligase[4] and is of unknown significance. Perhaps it is a way of handling acetaldehyde until it can be metabolized.

Discussion

The finding[5] that the reacting sulfhydryl group of phosphoglyceraldehyde dehydrogenase is supplied by glutathione functioning as a prosthetic group might be correlated with the transitory improvement reported[6] in mental patients who received infusions of glutathione (it favored aldehyde dehydrogenase activity over oxidase activity).

The occurrence of psychotic reactions in patients on long-term Disulfiram therapy supports the idea that aldehyde oxidizing enzymes are involved in disturbed cerebral biochemistry. In blocking the oxidation of ethanol, Disulfiram acts at the acetaldehyde level.[7] In the event of psychosis, the activity of aldehyde oxidizing enzymes may have been turned against aldehydic substances, mentioned above, essential to psychic well-being.

The syndrome of acute acetaldehyde poisoning (flushing, headache, tachycardia, dyspnea, angina, dizziness and nausea), produced by premedicating with Disulfiram and then administering liquor, bears some resemblance to the para-hallucinogenic effects

of lysergic acid diethylamide (LSD). An analogy in the formulas of the two compounds suggests that this is not a chance coincidence. The diethylaminocarbonyl group $-CON(C_2H_5)_2$ of LSD and the diethylthiuram group $-CSN(C_2H_5)_2$ of Disulfiram differ only by the interchange of sulfur and oxygen atoms. Sulfur appears under oxygen in the same group of the periodic table, and organic sulfur compounds closely parallel the corresponding oxygen compounds. The prolonged nature of the hallucinogenic effects of a minute quantity of LSD might be related to an anti-oxidant property of LSD which delays its detoxication.

The unexplained rise in the elimination of uric acid after alcohol ingestion[8] may be an illustration of enzyme-substrate promiscuity in which the increased activity of xanthine oxidase (as a group specific aldehyde oxidizing enzyme) induced by the acetaldehyde derived from alcohol is carried over to its role in purine catabolism. The beneficial effect of iron infusion for acetaldehyde poisoning may be due to potentiation of the ferroenzymes xanthine oxidase and liver aldehyde oxidase.

Delirium tremens, usually associated with alcoholism, sometimes occurs with habituation to chloral hydrate or paraldehyde. Comparison of the intermediate metabolism of ethanol, chloral hydrate and paraldehyde reveals that a two-carbon aldehyde is formed in each instance (acetaldehyde twice and trichloracetaldehyde in the case of chloral hydrate). If, as suspected, delirium tremens is a withdrawal syndrome, its pathopharmacology may lie in the sudden destruction of the aldehydic substances mentioned above, essential to psychic well-being, by aldehyde oxidizing enzymes abruptly deprived of their large supply of exogenous substrate. Paraldehyde and chloral hydrate are more effective than other agents in the management of delirium tremens associated with alcoholism probably because of the partial replenishment of exogenous aldehydic substrate incidental to the catabolism of paraldehyde and chloral hydrate.

Acute experimental ethyl alcohol intoxication in man causes a marked decrease in the urinary excretion of 5-hydroxyindoleacetic acid, the end product of serotonin metabolism. It is conceivable that some alcoholics (consider those who suffer episodes of hallucinosis and finally manifest schizophrenia) are in a sense sparing themselves through drinking by diverting overactive aldehyde oxidizing enzymes from endogenous aldehydes to those derived from alcohol.

The isolation[9] of hydroxy-o-methyl transferase from the pineal gland may be related to the beneficial effect of pineal gland extract in mental illness. When serotonin is inactivated by N-acetylation and O-methylation, no aldehydic stage appears so that susceptibility to aldehyde oxidizing enzymes is diminished.

The inhibition of brain oxidation by toxic amines is explainable in terms of substrate induction. Their detoxication involves the formation of aldehydic intermediates

$$RCH_2NH_2 \rightarrow RCH = NH \rightarrow RCHO + NH_3$$
$$RCHO \rightarrow RCOOH$$

which further the activity of aldehyde oxidizing enzymes.

Summary

A biochemical basis for mental illness has been suggested in which the appearance of aldehydic intermediates in two reactions of the Krebs Cycle exerts a profound influence on the psyche by promoting the activity of aldehyde oxidizing enzymes.

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An Objective Method of Determining Psychiatric Treatment

EDWIN DUNLOP, M.D.

In 1951[1-5] an objective method of testing the autonomic nervous system was described by Funkenstein, Greenblatt and Solomon which has continued to be of considerable value to psychiatrists attempting to correlate physiological changes that appear in the autonomic and central nervous system in relation to nervous and mental disturbance. The Funkenstein Test has been widely used and is a most important diagnostic tool in supplementing clinical judgment for the selection of specific, appropriate treatment.

In the last ten years, we have followed very closely the modified type of testing devised by Funkenstein and in a series approximating 2,000 patients have found this test to be 85 per cent accurate in predicting the outcome of treatment.[6] The test is essentially a simple procedure which can be done in the hospital, clinic or physician's office and requires little training for a technician to learn the procedure.

With the tremendous impact of psychopharmaceutical drugs in the last five years, it has become increasingly important to diagnose accurately and select appropriate treatment for the patients needs. Many of the better tranquilizers and phenothiazine derivatives, if given to a depressed patient for a time, will not improve the depression and in fact will cause further deterioration of the patient's mental condition. Similarly if antidepressants (there were more than five introduced in 1959) are prescribed for a patient who shows a marked anxiety component in his illness, he may also fail to respond to treatment. It is, therefore, important for physicians to be fully informed from every available source regarding the patient's specific needs with such a wide array of drug therapy available. The same applies for electroshock and insulin coma therapy. Both of these treatments are still used extensively and electroshock has, by no means, been eliminated nor is it likely to be in the immediate future, in spite of enthusiastic claims from advocates of the antidepressant agents. Coma and sub coma insulin therapy are still of great value in psychiatric treatment and there has been a resurgance of interest and activity in this well established treatment.[7]

With the ever widening modalities of electroshock treatment, modified and unmodified, coma and sub-coma insulin therapy, energizers, tranquilizers, psychosedatives and psychostimulants, one should be certain what is to be corrected in the patient's abnormal physiological and autonomic reactions before presenting treatment. One of the essentials of the Funkenstein Test is to plot the changes in systolic blood pressure which occur following the intravenous injection of epinephrine. This is subject to considerable human error. It is extremely difficult to predict how a patient's blood pressure will rise within 60 seconds following an intravenous injection of this circulatory stimulant. Many patients' systolic pressure will rise 150 to 200 mm. of mercury above their normal reading. The rapid return to homeostasis is completed within another 60 to 90 seconds.

For some time I have been looking for a convenient way to record these rapid changes more accurately. Except for intra arterial cannulation, which in itself presents a hazard and was therefore rejected, no other form of recording was available. Recently, a new type of equipment, manufactured in England, was introduced. It was designed by J. H. Green, M.D.,[8] Middlesex University Medical School, London, England. With this machine we are able to accurately portray the changes in systolic pressure in a graphic fashion. The Winston Blood Pressure Follower[9] has been designed to follow continuous changes in systolic blood pressure over long periods of time without the need of arterial puncture. The apparatus is simple to use but familiarity with the principles of operation must be understood before the testing is begun.

From Fuller Memorial Sanitarium, So. Attleboro, Mass.

The arterial pulsation from the digital artery of a finger is picked up by a piezo-electric crystal placed over this artery. This pulsation is employed to open an air valve which inflates a cuff from a small pump in the apparatus. This cuff occludes the artery proximally to the point of application of the crystal, and when this occlusion is complete, the air valve closes and a leak allows the cuff to deflate until pulsations reappear when further air enters the cuff. The apparatus thus maintains the cuff at the same pressure as that of the digital artery.

The cuff has been designed to enclose the entire finger and to raise the pressure of the finger tissue to the level of the arterial pressure. In this way the cuff acts as a "G-suit" on the finger and allows a normal exchange of tissue fluid, nutrition and metabolites to continue with the small blood flow occurring when the cuff pressure is below that of the digital artery. This, coupled with low metabolism of the finger, permits the cuff to be kept in position for four hours or longer without cyanosis or edema developing. The cuff is comfortable and there is no pain during its use. The crystal is placed against the finger and strapped to the palmer surface of the digit over the middle phalynx with the sensitive edge corresponding to the edge of the finger. Elastic strapping is preferred. The strapping should be tight enough to insure a good contact between finger and crystal but not so tight as to obstruct blood flow.

Just as in recording the brachial artery pressure by the Korotkov sounds method, the exact pressure at which sounds are first heard depends on the aural acuity of the observer, so the pressure recorded from the digital artery of the blood pressure follower depends to some extent on the sensitivity of the apparatus itself. However, there is an electro magnetic setting of a valve which is operative and the cuff pressure will follow directly that of the digital artery pressure. We have used this method of testing on a considerable number of patients and find that the human error which so often entered into the Funkenstein modification is inconstquential. This is wholly a mechanical recording and permits little human error. The rate of response is accurately recorded. There is a mercurial manometric measure in millimeters, also a dial measure in millimeters corresponding to the systolic pressure.

We have found this equipment of extreme value in the accurate testing of the ANSR to epinephrine and mecholyl. Its further use would include the reaction to hypotensive and hypertensive drugs and the many newer drugs in psychiatric treatment which induce hypotensive responses. There are undoubtedly greater areas of usefulness for this equipment outside the fields of neurophysiology and it might be utilized in surgery, or in any other situations where circulatory changes are significant.

Author's Note: This machine was loaned to the Fuller Memorial Sanitarium through the courtesy of Dynamic Corporation of America, New York, N. Y.

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Toward a Definition of Psychotherapy

CHARLES B. DAVID, M.D.

The growing demand for psychiatric treatment in the last 15 years and the need for non-psychiatrists in therapy within hospitals, clinics, and private practice have resulted in a dilution of the meaning of psychotherapy. In the next decade, the demand for highly trained personnel in every field will be even greater. It is estimated that if all the college graduates in the next ten years were to enter teaching, only then would that profession be adequately staffed. The shortage of trained personnel in mental health will continue as competition grows among the various scientific disciplines for the college graduate. It seems all the more urgent to try to delineate the psychiatrist's role.

Most of us have obtained our professional training within the last 15 years. We have participated in the expansion of our specialty and have seen a wider acceptance and use of psychotherapy. We have not paused long enough to view some of the consequences of our rapidly expanding specialty. In fact, most of us, during or after completion of our formal training, have helped to disseminate our knowledge to our colleagues and members of allied professions. At times, we have been zealous missionaries, interested in spreading the gospel among any and all who would listen. Never mind the embarrassment of being discovered to be repetitive or of not knowing as much as we presumed. New and dynamic explanations for human behavior were available to and applicable by those who availed themselves of such opportunities. However, dissatisfaction among those who come to learn seems to be the result.

In recent years, the attempt to define psychotherapy has become a controversial issue among psychiatrists and between psychiatry and other disciplines. The official position of the American Medical Association, the American Psychiatric Association, and the America Psychoanalytic Association is: "Psychotherapy is a form of medical treatment and does not form the basis for a separate profession." However, a broader definition might be: "Psychotherapy is a planned technique of altering the maladaptive behavior of an individual (or group) toward more effective adaptation. The essential ingredient of psychotherapy is the utilization of the therapist's personality interacting with the patient's personality."

One is thus given a choice, depending on his own experience and bias to accept the restrictive definition as proposed by organized medicine or to agree with the latter definition, which in a broader sense can be the professional property of not only non-psychiatric physicians but also of psychologists, social workers, teachers and ministers.

Szasz[1] has challenged the stand of the medical organizations. He argues that such a restrictive definition is institutional, rather than instrumental and compares it to prohibitions imposed by authoritarian groups in self protection. He contends that non-medical psychotherapists have contributed impressively to the theory and practice of psychotherapy; that the conditions for which people seek help are problems in living; and that the medical training of the psychotherapist is of little value to the psychiatrist in his therapy. He proposes the licensing of persons officially designated as experts on the basis of technical training and competence. He adds, "This would enable persons seeking psychotherapy to choose between those officially designated to do this kind of work and others not so qualified. Those not officially designated as 'psychotherapists' would nonetheless be permitted to engage in this activity, although they would be barred from representing themselves as 'officially qualified.'"

It seems to me that such a proposal in order to be effective would have to be predicated on agreement as to just what constitutes technical training and competence. Until some rearrangement of the training program is made, as for instance, to grant a doctorate in medical psychology as advo-

cated by Kubie, we shall have to accept the fact that psychiatry and psychoanalysis in this country have been linked with the development of medical science.

Psychotherapy is defined here as a specialized medical procedure in which the trained psychiatrist during the interview, uses as his main therapeutic tool dynamic concepts judiciously in the clinical management of the patient. I should like to elaborate on the elements of this definition, which by no means is presumed to be the "last word."

As a specialized medical procedure, psychotherapy bears the ethical and legal responsibilities of any other medical transaction between doctor and patient. Zilboorg[2] once wrote that the physician, by the nature of his training, achieves a therapeutic intent toward his patient which no other discipline grants. This is not to deny that non-medical personnel has empathy for and interest in the welfare of clients or patients. But the moral responsibility the physician has toward his patient cannot be learned except within the medical discipline. The ethics of certain physicians may be questioned, but the majority of physicians are guided by the principle of the primacy of the welfare of their patients. Then too, as a medical specialist, the psychiatrist is supposed to have gained clinical experience, under close supervision, about the dynamic nature of the interview by which he is able to effectively influence the patient toward a healthier mental state. Ideally, the psychiatrist's training should have qualified him to capably deal with both the acute personal crises of patients and the chronically disabling neurotic or psychotic disorders.

In medical practice, the moral and legal responsibilities the physician has in regard to his patients cannot always be sharply separated. Yet we are being forced to recognize more legal danger zones in what was once a mutually understanding doctor-patient relationship. The psychotherapist has been relatively free from medico-legal suits but is he not chancing a law-suit by supervising non-medical personnel in private practice?

It is said that a medical education is unessential to the psychotherapist because he rarely if ever examines or treats his patients for their physical ailments. The point that is missed is that psychotherapy in order to be effective, has to be based on knowledge about health and disease and their various manifestations. Why must we exclude the amount of knowledge we have gained about the biology of man though we are not examining and treating him as other physicians do? A medical training is valuable not only for differential diagnosis, but it provides a degree of comfort in the psychiatrist because he knows that he knows about physical illness. He may never find need to examine a patient, but his medical knowledge is constantly being tested by the patient's shifting physical complaints.

The interview is a treatment situation in which a dynamic interaction between the participants begins with the initial interview and continues throughout the course of treatment. The trained psychiatrist, by observing the dynamic quality of the interview, can make use of his observations in the interest of his patient. By training in dynamic concepts is meant that experience the psychiatrist has gained during his residency years in the treatment of patients under close supervision. It is assumed by non-psychiatric physicians that the acquisition of knowledge about dynamic concepts from reading or lectures is sufficient to prepare them to treat the emotionally disturbed. To suggest to these physicians that close supervision with their cases is necessary over a long period of time is to insult them.

Psychotherapy has been designated by many terms. As Appel[3] has said recently, psychotherapy can be a multifactoral approach, utilizing technical means ranging from abreaction to drug therapy. But such means as suggestion, support, ventilation, manipulation, counselling, advice, direction and drugs cannot be claimed exclusively as psychiatric skills. The general physician, the minister, the counsellor, the social worker and anyone who deals with people has and can use these tools effectively. But what the psychiatrist can lay claim to is his knowledge and experience in the use of dy-

namic concepts in treatment. To quote Appel[3] again:

"Psychoanalysis is reserved, as are some other methods, for the specialists. However, psychoanalytic theories and practice have great influence on standard psychotherapy today. All methods can be used at different times in treating the same patient on different patients. . . . Psychoanalysis has been largely incorporated into general psychiatry. Among the psychoanalytic concepts now recognized are those of the unconscious, repression, resistance, dissociation, defense mechanism, transference, abreaction, analysis and insight."

However, just as the experienced surgeon knows where to stop cutting, so the experienced psychotherapist should be judicious about the use of these concepts. Fenichel,[4] in his paper, stated:

"Psychotherapy, based on psychoanalytic knowledge, can change this state of affairs (*referring to methods of psychotherapy in which the results were not understood*). The knowledge can be used for the purpose of establishing a dynamic diagnosis. This dynamic diagnosis will enable the psychotherapist to predict with a certain degree of probability what the patient's reactions to certain measures will be. Combinations of limited interpretations, provocations of certain types of transference, the providing of well chosen substitutive outlets, alterations of the environment, suggestions or prohibitions of unconsciously tempting or reassuring situations or activities, a verbalizing of actual conflicts, mental hygiene advice—all these can very well be arranged on a systematic basis.

"It is to be hoped that under the pressure of bitter practical necessity, a psychoanalytic theory of non-psychoanalytic influence will soon be advanced."

It is peculiar to psychiatry, as compared to other medical specialties, that there is seldom any informal group discussion about clinical work. We seem to be embarrassed to expose our work to the scrutiny of our colleagues except in casual statements about a particular episode with a particular patient. The result is that we are ignorant about our colleague's clinical work and take much for granted. For example, the matter of fees. How many of us have really exchanged ideas about fee schedules, manner of payment, and charging or not charging for cancelled hours and vacation time?

It seems essential therefore, to attempt a more precise understanding of our clinical work. A seminar group, meeting periodically, composed of six or seven congenial members, would be a step in the direction of sharing clinical work. Beyond the years of our formal psychiatric training, there is insufficient exchange of ideas in small informal seminars, without the fear of embarrassment or power struggles. In this way, we may begin to formulate a more coherent image of what a psychotherapist does. Formal meetings are too infrequent and participation too limited.

In the last three years, we have had two such seminar groups meeting once a month. They are informal, composed of six or seven members, who rotate in presenting material for discussion. We meet in each other's homes or offices. Topics for discussion may be clinical cases, theoretical questions, or a review of some outstanding paper in a current periodical.

My impression from participating in these two seminar groups has been that there is more similarity than difference in our techniques with patients. I don't believe this is primarily due to our similar training or theoretical bent. I would presume that a group of practicing psychiatrists in discussing case material would find agreement among themselves on technical methods, regardless of whether they had psychoanalytic training. The final test would be the formation of such groups to share and compare clinical experiences. Perhaps, we can then achieve a clearer image of the psychotherapist and what he does and be better able to inform those outside our specialty.

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Problems in Communication for the Psychiatrist

JOHN D. MORIARTY, M.D.

It has been truly stated that of all the problems confronting us only about 10% are technologic and 90% are of human origin. This applies all the way from the individual level to the international area. Of the human problems the majority are tied up with difficulties in communication. We have adequate technology to stamp out much disease and pestilence, for example, malaria and cholera in India, but we seem unable to secure human cooperation in adjusting communication difficulties. Since the psychiatrist is supposed to be, and should be, an expert in solving many aspects of communication problems, I have undertaken to point out some of the obstacles that he himself faces in this situation.

Communication involves verbal and non-verbal means of the transmission of messages from one individual to another and among groups, large and small. Non-verbal forms of language fall into three general categories: 1) sign language, including gestures, 2) action language, embracing all movements that are not used exclusively as signals, and 3) object language such as architectural structures, art objects, and even the clothes one wears.[1]

In our culture there is an implicit belief in the magic of words. Words are treated as absolutes, especially by people of advanced academic education such as lawyers,, politicians, administrators, teachers, and psychotherapists. Unfortunately, the structure of our language is such that even for "normals," communication difficulties inevitably occur. Take, for instance, the word "normal" itself. A lawyer asks the medicolegal expert on the witness stand, "Doctor, isn't the defendant perfectly normal, just like you and me?" The patient who consults the psychiatrist may state his problem as wanting to be "normal just like everybody else." Or the patient may argue bitterly that his interpersonal difficulties are entirely beyond his control because he always is "perfectly normal." So it is apparent that even for the relatively healthy person the structure of our language leaves much to be desired in terms of accurate and rewarding communication.[2,3]

The psychiatrist's problems of communication may be divided into five categories:

1. Most obviously, he continually strives to improve communication with his individual patient or with a small group of patients in group therapy.

2. He is often plagued by communication difficulties with the patient's family or employer or others important in the patient's immediate environment. (I occasionally remark ruefully that while we don't have too much trouble communicating with most of our patients, often the job of getting the message over to the relatives seems difficult or impossible.)

3. On a broader basis, the psychiatrist often has difficulty in this field with reference to his psychiatric colleagues. A major criticism by non-psychiatrists is that the psychiatric profession is divided into opposing schools and factions who seem to be more in general disagreement than anything else. These communication difficulties are often most apparent at psychiatric conventions and meetings. This seems to stem from the different bases of value accentuated by language difficulties that inevitably arise.

4. The psychiatrist has a problem with his non-psychiatric colleagues, since there frequently is a lack of mutual understanding. Part of this is due to language difficulties, including the general physicians' conceptions that psychiatrists rely too much on a peculiar jargon. The misunderstandings are also fundamental and relate to differences in the methodology of handling psychiatric disorders as compared with organ dysfunctions.

5. The psychiatrist may have intra-personal problems in communication, i.e. with

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himself. Since no human is free from bias and stereotyped attitudes, it is inevitable that the therapist's distortions will, to some extent at least, interfere with his communicating with the patient. This has led the psychoanalytic institutes to insist that a psychoanalytic candidate first undergo a "complete analysis," with the aim of ridding him of his irrational complexes and neurotic responses. While this is doubtless a worthy goal in theory, it is generally accepted that in practice no such ideal result is ever achieved. Although a personal analysis may be useful in reducing intra-personal disturbances of the therapist, it is important that these personal neurotic attitudes be not replaced by group-shared prejudices and distortions—namely, those of the particular psychoanalytic "school" where the therapist gets his training.

Communication Pathology

This paper is concerned primarily with the clinical problems of the psychiatrist. If we agree that communication disturbances are inevitable with all individuals, it becomes a matter of defining types of disturbances that are more serious and may be associated with recognized psychiatric disorders. When we talk of psychopathology, we speak of delusions, hallucinations, flight of ideas, obsessions, compulsions, conversion symptoms, etc. It has been pointed out by Ruesch that all of these terms refer specifically to disturbances of communication. Thus, they imply either that perception is distorted or that expression or transmission is unintelligible.

Much has been written about language pathology in schizophrenia, by Kasanin,[4] by Korzybski,[2] and others. Quoting Spiegel[5]:

> "In schizophrenia there is a montage of disturbed communication. Not only is communication seriously damaged in every direction—intrapsychic, perceptual, and interpersonal—and in its various modes, but its pattern varies with the different phases of schizophrenia. Indeed, the communication patterns give each of the phases its character."

This distortion of communication prevents the schizophrenic from receiving messages correctly and from correcting such information that he already possesses. Unable to correct this inaccurate information he builds progressively a distorted model of himself and of the world. Such views result in increasing isolation, as the distorted information renders impossible appropriate interaction with others.

Illustrative Case History

The following excerpts from the case history of a 29-year-old single girl illustrates certain serious disturbances in the capacity to accurately receive information and to transmit it. This patient had been under treatment a considerable time for a severe anxiety and phobic reaction which seriously crippled her adjustment but which permitted her to function up to a certain point in the social and economic spheres. Unfortunately, she could not break away from an unhealthy family situation where parents and a brother were also emotionally disturbed to a serious degree. She became involved in a bizarre sexual affair with a young Mexican and under the stress of the situation she "decompensated" further, so that she developed a paranoid reaction. She broke off psychiatric treatment but continued some contact in the form of a constant flood of letters to the therapist, many being sent by registered mail. I have abstracted passages from the letters to illustrate certain points:

> "I do not like to be misinterpreted and I will be misinterpreted until you no longer surmise but ask. There is nothing I can say, do, wear, eat, drink, etc. that will tell you what I think or mean, and don't fool yourself that it will. I will avoid all of you until my opinion is asked.
>
> "Here I am angry. I am angry at every insane, destructive, indirect thing that has gone on. I am angry at every misinterpretation, and I'm angry because you all took my life without a qualm. I live in a world of liars, stinkers, malicious deliberate gossips, destructive people, symbolists, and parents, people who defeat you before you have a chance to begin. I don't like these people, they cause confusion and destruction and not one person speaks up to explain. No, I am not going to get the message. Someone can speak up if I am to get any message. . .
>
> "If you really want to know the meaning of the honking, ask William. He knows and only he. Ask him, because surely the honking has some profound meaning known only to him. It isn't just that William makes unrefined noises or anything simple like that, it just has to be something of great meaning. You see all this honking is a secret code, known only to William—it isn't just a noise or anything simple."

To make a few comments about this patient's neurosemantic difficulties, her paranoid reaction started with a partial basis in external reality, in the sense that some of the Mexican boy friend's companions would honk at her as she walked by. Then (by extension) everybody was honking, it seemed to her, and the honking took on a special meaning of a "secret code." Over the period of the next several weeks further distortions in her abil-

ity to receive and transmit information developed, so that she became convinced that the therapist was involved in the "plot" to disturb her by the honking and by other means. She broke off treatment, quit her job, and has had increasing difficulties. Although her mother contacted us several times, she has not followed our recommendations that the girl have further treatment in a hospital. One is struck by the marked feeling of isolation and estrangement from people shown in the patient's writings. Doubtless the flood of letters represents a pitiful attempt to maintain contact with the therapist, in a groping effort to bring some order out of the chaos. Unfortunately the patient has reached such a state of semantic confusion that it is impossible to communicate with her therapeutically.

It is my opinion that since this paranoid reaction has been going on for almost a year and since the central communication mechanism has broken down, it is not feasible nor practical to correct this through the feedback of psychotherapy in this stage of the patient's illness. Clinical experience in similar cases leads me to believe that considerable improvement in communicative mechanisms could be achieved through cerebral electrotherapy, and I would even venture to predict that after six to eight such treatments the patient would be more accessible to psychotherapy. Unfortunately, our capacity to communicate with this patient's family is extremely limited, due to their own emotional disturbances, which border on the psychotic.

In contrast to the psychotic patient the neurotic patient seems to suffer from a different type of communication disturbance. By and large he tends to flood others with a repetitive series of stereotyped messages trying over and over again to influence their behavior in the way that he desires.[6] When these repeated messages—for example, nagging of a chronically dissatisfied wife—fail to coerce the other person (or persons) into the desired activity, the neurotic patient becomes increasingly frustrated and strives only harder to use the same non-adaptive methods. The hysterical personality may use demonstrable bodily signs to communicate with others, while the psychopathic personality favors actions which will please or displease the other person. The compulsive intellectual and the fanatic broadcast their messages uninterruptedly and attempt to influence others without being concerned with the actual effects of their behavior upon other people. The more mature person is more cognizant of the reciprocal effects of communicative actions and of the consequent beneficial results in successful human relations.

As Ruesch[1] points out, psychosomatic patients seem to have an asynchronization between their flow of words and their feelings. Although they may be skillful in manipulation of verbal symbols, this asynchronization does not permit adequate expression of their feelings which may be short circuited or discharged into neural circuits involving a particular organ or organ system. In this sense, the psychosomatic patient is fixated at, or tends to revert to, a primitive body language, such as is normal in the infant or very young child. Their physical symptoms are frequently used for purposes of communications, as for example certain asthmatic attacks.

As regards the psychopath, Cleckley[7] has accurately described him with the term "mask of sanity," pointing out that he suffers from a semantic dementia. Persons who come in contact with a psychopath in any sort of close way are continually being frustrated, angered, hurt, and even demoralized by their failure to comprehend this basic fact—namely, that the psychopath uses verbal symbols, etc., in a way that appears to conform with their conventional meaning but actually does not. Thus, the psychopath may say:

"Lend me $10.00 until pay day Friday. I will pay you back as soon as I get my salary." What he means is: "I want the $10.00 now and I don't care if you have need for it —I will not be concerned about tomorrow, much less Friday—I'll pay you back if it's convenient or if you cause trouble or if I happen to inherit a hundred thousand dollars in the meantime."

In fact, the psychopath's facsimile of conventional meaning may be so misleading that he may, for some time, fool the most astute psychiatrist, unless and until the latter accumulates enough information (often

from other sources) to arrive at an understanding of the type of communication difficulty he is dealing with. The relative absence of guilt feelings in the psychopath permits him to use verbal symbols, etc., as a means of manipulating people to achieve his egocentric needs without regard for the effect on others.

Communication in Psychotherapy

In psychotherapy the physician attempts to elicit and evaluate the distortions of communication with which the patient is afflicted and then by a gradual feedback mechanism, to correct these distortions. In classical psychoanalysis, with the patient reclining on the couch, the patient may express reveries, fantasies, and other feelings that he is less likely to give vent to under most circumstances. However, the process of correction by feedback from the therapist tends to be very gradual and, consequently the same distortions may be repeated by the patient over and over. Also, in the recumbent position on the couch with the analyst out of sight (and sometimes seemingly almost out of sound) the patient may feel as if he were part of a sensory deprivation experiment where there is insufficient input to maintain effective communication. Sullivan[5] has described the therapist as a participant-observer, and many times the classical analyst may seem to the patient to have reduced his participant role almost to the zero level.

On the other hand, the therapist who believes in the value of a face-to-face interview situation, and who places emphasis on the participant as well as the observer role in the psychotherapeutic process, is able to provide more frequent corrections of information to the patient through the feedback system of the interview. Obviously, this is done not only through verbal means, but also through associated non-verbal cues such as gesture, facial expression, posture, etc. While in classical psychoanalysis a patient is left to his own fantasies and associations until such times as he himself comes face to face with his distortions and then, perhaps, experiences a sudden insight, in other types of therapeutic communication, distortions are not permitted to grow to such magnitude and are corrected little by little as the opportunity arises. Interpersonal feedback, therefore, produces three results: mobilization of unconscious information, utilization of non-integrated information that the patient already possesses, and the acquisition of new information.[9]

In explaining the effective basis of psychotherapy, much has been written about 'transference,' 'counter-transference,' 'overcoming of resistances,' and other psychoanalytic concepts. These all refer to special aspects of communication between therapist and patient. It is generally agreed that the relationship between the two participants in the joint venture of psychotherapy is of paramount importance, and this directly involves the interpersonal feedback. As increasingly satisfying communication is established, the gratification becomes a driving force which induces the patient to seek further improvement. One of the most important effects of this process is to reduce the patient's sense of isolation and loneliness.

Summary

Although problems in communication, verbal and non-verbal, are of crucial importance in the practice of medicine and psychiatry, this is often only implicitly recognized. The distortions of our language structure inevitably create communicative difficulties even for "normals," all the way from the individual to the international level.

Terms in psychopathology—i.e., delusions, hallucinations, obsessions, conversion symptoms, etc.—all refer to serious disturbances in communication. When we use chemical or other modalities of treatment, such as tranquilizers or electroconvulsive therapy, our principal implicit goal is to improve the functions of the communicative apparatus. The same goal is approached only by a different method in psychotherapy.

Whatever his methods of psychotherapy, the physician attempts to create a favorable relationship (whether called "transference" or "rapport") for corrections of the patient's distortions in communication by interpersonal feedback, which ideally is carefully

timed and skillfully structured. Favorable response is reflected in an increasing reduction of the central feeling of isolation and loneliness prominent in most emotionally ill persons.

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